



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

HP 647.3 (1901)

Harvard College Library

BOUGHT WITH INCOME

FROM THE BEQUEST OF

HENRY LILLIE PIERCE,
OF BOSTON.

Under a vote of the President and Fellows,
October 24, 1898.

THE INTERNATIONAL YEAR BOOK

**A COMPENDIUM OF THE WORLD'S PROGRESS
DURING THE YEAR**

1901

EDITOR

FRANK MOORE COLBY, M.A.

CONSULTING EDITOR

HARRY THURSTON PECK, Ph.D., L.H.D.

Professor in Columbia University

ASSOCIATE EDITOR

EDWARD LATHROP ENGLE, B.A.

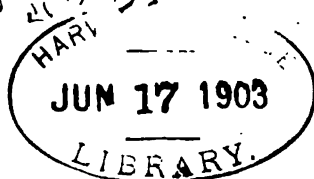


NEW YORK

DODD, MEAD & COMPANY

PUBLISHERS

~~11-2-5-1-1-1~~
✓ HP 697.3 (1901)



Pierre Fund.

COPYRIGHT, 1902
BY
DODD, MEAD AND COMPANY

PREFACE.

THE INTERNATIONAL YEAR BOOK for 1901 is the fourth volume in the series. Its three predecessors have been received in a manner to justify the view of the editors and publishers that a work of this kind would be widely useful and favorably regarded. It was expected that it would meet with some criticism in detail and that suggestions would be made as to possible means of improvement; but in the numerous and for the most part highly commendatory press notices and reviews there has been little of such criticism or suggestion. As indicating approval, both of the plan and of its execution, this has been most gratifying to the editors. At the same time criticism of a constructive sort would be most welcome and would undoubtedly suggest means for enhancing the usefulness of the book to its readers. The YEAR BOOK for 1901, while not departing from the plan of its predecessors in essentials, has aimed at a greater degree of condensation, and to this end has altered somewhat the method of treatment in the articles on the States of the United States. Certain classes of statistical matter formerly given under the separate States have been tabulated under general heads. Thus, instead of including in every article on a State a separate paragraph on Educational Statistics, the figures are given in consolidated tables under the following heads: EDUCATION IN THE UNITED STATES; SCHOOLS; NORMAL SCHOOLS; PROFESSIONAL SCHOOLS; and UNIVERSITIES AND COLLEGES. This method admits of the introduction of more general discussion pertaining to the subject as a whole, and offers a means of comparison. Again, the statistics of the Crops will be found in the articles on the crops themselves (BARLEY; CORN; WHEAT, etc.), which sum up the yield by States so far as the figures are available. And the same rule applies to Banking Statistics, which will be found in the articles BANKING; STATE BANKS; PRIVATE BANKS; NATIONAL BANKS; SAVINGS BANKS, and TRUST AND LOAN COMPANIES; to RAILWAYS, and to the principal minerals (COAL, COPPER, IRON, etc.). The space thus gained has made it possible to include in the articles on States an account of the progress of Industries, based on the Census Reports on Manufactures, most of which were published in 1901, and to notice the great body of State Legislation. Since most of the State legislatures meet in the odd-numbered years, the latter subject has necessarily received more extended treatment than in 1900.

In the political history of the year, the matters of most interest to Americans are naturally those which have to do with the pacification and government of the new possessions of the UNITED STATES. Chief of these was the decision of the Supreme Court in the insular cases. Next in importance were the beginnings of civil government in the PHILIPPINES, the adoption of a constitution for CUBA, and the progress of PORTO RICO under her new government. The industrial record was remarkable for the formation of the largest trust of modern times, the UNITED STATES STEEL CORPORATION; for one of the largest STRIKES of recent years, the Steel Strike; and for the taking of an important step toward the ARBITRATION of labor disputes by the formation of the National Civic Federation. The financial record, instead of being scattered under different heads, is in this volume comprised in a single article, the FINANCIAL REVIEW OF THE YEAR. Among the important topics in foreign affairs are the advance of RUSSIA in Manchuria, PERSIA, SERBIA, and the BALKAN PENINSULA; the discussion of GERMANY's new tariff measure; the passage of the Associations Bill in FRANCE; the settlement of the indemnity question in CHINA; and the continued war in the TRANSVAAL. In GERMANY the results of the 1900 census became available during the year, and in FRANCE and GREAT BRITAIN the census returns for

1901 were published. In AUSTRIA-HUNGARY the Reichsrath for the first time in years enjoyed a period of orderly procedure, compressing in that interval much important legislation. The legislative record for AUSTRALIA and the Australian states during the first year under the federal constitution has an especial interest. In the department of biography the death roll includes the names of QUEEN VICTORIA, MCKINLEY, HARRISON, LI HUNG CHANG, VERDI, CRISPI, ROWLAND, FISKE, etc. Some of the features of the scientific record are: The progress in AERIAL NAVIGATION; Loeb's and Mathews's experiments in PHYSIOLOGICAL CHEMISTRY; Marconi's successful application of WIRELESS TELEGRAPHY; in PHYSICS, the foundation of the Bureau of Standards at Washington to serve as a national physical laboratory; in ASTRONOMY, the discovery of a new star in Perseus; in MEDICINE, the continued progress of SERUM THERAPY; in MAMMALOGY, the discovery of a new species of mammal, the Okapi; in PSYCHICAL RESEARCH, the renewed interest in the famous Piper case. Interest in ARCTIC EXPLORATION was sustained by Peary's report of a nearer approach to the Pole, and by the departure of the magnificently equipped Baldwin-Ziegler Expedition; and in ANTARCTIC EXPLORATION the operations of the year were the most important that have been undertaken for more than half a century. In the literary record of the year an attempt has been made, not only to describe briefly the principal books, but to reflect so far as possible the current discussion of their qualities. Thus, the article on LITERATURE, AMERICAN AND ENGLISH, avoiding on the one hand the character of a mere catalogue, and on the other that of an essay on a few selected books, presents a running commentary on a large number of the most important books of the year. The addition to the staff of contributors of a government official and authority on agricultural matters has made it possible to present in the articles AGRICULTURE, HORTICULTURE, and DAIRYING, as well as in the separate articles on the crops, an adequate treatment of the scientific and practical progress of the year.

FRANK MOORE COLBY.

New York, April 10, 1902.

The International Year Book

EDITOR
FRANK MOORE COLBY, M.A.

CONSULTING EDITOR
HARRY THURSTON PECK, Ph.D.

ASSOCIATE EDITOR
EDWARD LATHROP ENGLE, B.A.

OFFICE EDITORS

MANSFIELD ALLAN, B.S.	- - -	{	AMERICAN AND ENGLISH GOVERNMENT AND POLITICS
RENWICK WYLIE ABBOTT, B.A.	- - -	-	BIOGRAPHY

LIST OF CONTRIBUTORS

HAROLD JACOBY, Ph.D.	- - - - -	ASTRONOMY
Professor of Astronomy, Columbia University		

ALFRED CHARLES TRUE, Ph.D.	{	AGRICULTURE, FORESTRY, CROPS, IRRIGATION
United States Department of Agriculture		

CHARLES S. HILL, C.E.	{	CIVIL, SANITARY AND EL- ECTRICAL ENGINEERING
Associate Editor <i>Engineering News</i> , New York		
M. N. BAKER, Ph.B.	{	
Associate Editor <i>Engineering News</i> , New York		

HERBERT T. WADE, B.A.	- - -	MANUFACTURES AND PHYSICS
------------------------------	-------	---------------------------------

ALBERT WARREN FERRIS, M.A., M.D.	- -	MEDICINE
Assistant in Neurology, Columbia University, and Assistant in Practice of Medicine, University and Bellevue Hospital Medical College.		

MARCUS BENJAMIN, Ph.D.	- - - - -	CHEMISTRY
United States National Museum.		

FREDERIC TABER COOPER, Ph.D.	{	AMERICAN, ENGLISH, AND CONTINENTAL LITERA- TURES
-------------------------------------	---	--

JAMES MORTON PATON, PH.D.	- - - -	ARCHÆOLOGY
Associate Professor of Greek, Wesleyan University.		
W J McGEE	- - - -	AMERICAN ARCHÆOLOGY
Ethnologist-in-Charge, Bureau of American Ethnology.		
JAMES MOONEY	- - - -	INDIANS
United States Ethnologist, Bureau of American Ethnology.		
HUBERT LYMAN CLARK, PH.D.	- -	BIOLOGY, ZOOLOGY
Olivet College.		
EDWARD SHERWOOD MEADE, PH.D.	{	POLITICAL ECONOMY
University of Pennsylvania.		AND SOCIOLOGY
WALTER TALLMADGE ARNDT, A.M.	{	FOREIGN POLITICS AND
		GAZETTEER MATTER
JOHN M. OSKISON, B.A.	- - - -	BIOGRAPHY
RODNEY M. HEGGIE, M.A.	- - -	RELIGIOUS BODIES
SIMEON STRUNSKY, B.A.	- - - -	FOREIGN POLITICS
JUDAH A. JOFFE, B.A.	- - - -	MUSIC
CHARLES LEONARD-STUART, B.A.	- - -	FINE ARTS
Formerly Editor <i>The Shopfar</i> ; Assistant Editor Baker's <i>Biographical Dictionary of Musicians</i> .		
HEINRICH RIES, PH.D.	- - - -	{ GEOLOGY AND MIN-
Instructor in Economic Geology, Cornell University.		
PAUL MONROE, PH.D.	- - - -	{ EDUCATION AND
Teachers College, Columbia University.		
ALBERT WHITE VORSE, B.A.	- -	{ ARCTIC AND ANTARC-
Secretary of the Arctic Club, 1900.		
WILFRID LAY, PH.D.	- - - -	PSYCHOLOGY
THOMAS GAFFNEY TAAFFE, PH.D.	- - -	SOCIETIES
CHARLES QUINCY TURNER	- - - -	SPORTS
Formerly Managing Editor <i>Outing Magazine</i> .		
H. T. PARKER	- - - -	DRAMA
MARTIN A. ROSANOFF, PH.B.	- -	CHEMICAL PHYSIOLOGY
W. B. KAVANAGH	- - - -	TRIPLE ALLIANCE
L. DEMOREST	- - - -	{ AUSTRALIAN AND CANA-
		DIAN STATISTICS

MAPS.

	PAGE
✓AFRICA,	8
✓ANTARCTIC REGIONS,	30
✓ARCTIC REGIONS	56
✓CHINA,	172
✓NICARAGUA AND PANAMA CANALS,	564
✓PLAN OF PAN-AMERICAN EXPOSITION,	596
✓ASIA,	612
✓LUZON AND THE PHILIPPINE ISLANDS,	616
✓SOUTH AMERICA,	722
✓FORMER BOER REPUBLICS,	768
✓TURKEY AND THE BALKAN STATES,	782
✓WEST INDIES,	852

ILLUSTRATIONS.

	PAGE
✓ FLYING MACHINES,	6
✓ ANTARCTIC EXPLORATION,	32
✓ ARCTIC EXPLORATION,	58
✓ AUTOMOBILES OF 1901,	90
✓ RACING AUTOMOBILES,	92
✓ NEW EAST RIVER BRIDGE,	120
✓ CALIFORNIA OIL FIELDS,	132
✓ FRANCESCO CRISPI,	222
✓ CUBAN ASSEMBLY COMMISSION,	230
✓ SCENES IN THE DANISH WEST INDIES,	236
✓ MME. BERNHARDT AND M. COQUELIN,	250
✓ BENEFACTORS TO EDUCATION,	288
✓ FIRE ENGINE OF 1901,	290
✓ HOSE WAGON OF 1901,	292
✓ LEADING FRENCH STATESMEN,	302
✓ GLASGOW EXPOSITION,	342
✓ EDWARD VII. AND QUEEN ALEXANDRA,	354
✓ THE HARVARD UNION, HARVARD UNIVERSITY,	370
✓ VIEWS OF LELAND STANFORD, JUNIOR, UNIVERSITY,	444
✓ LI HUNG CHANG,	448
✓ WILLIAM MCKINLEY,	464
✓ METROPOLITAN MUSEUM OF ART,	490
✓ NEW YORK MAYORALTY CANDIDATES,	558
✓ SCENES ON NICARAGUA CANAL ROUTE,	566

	PAGE
✓ SPECIMENS OF ROAD,	600
✓ TEXAS OIL FIELDS,	614
✓ THEODORE ROOSEVELT,	676
✓ YALE AND HARVARD CREWS,	678
✓ LEADING RUSSIAN STATESMEN,	682
✓ THE CELTIC,	704
✓ GIUSEPPE VERDI,	834
✓ VICTORIA,	838
✓ HOHENZOLLERN ARRANGED FOR WIRELESS TELEGRAPHY,	856
✓ COLUMBIA AND SHAMROCK IN DRY DOCK,	864
✓ NEW DINING HALL AT YALE,	866

The International Year Book 1901

ABBEY, EDWIN AUSTIN, the American artist, was commissioned in 1901 to paint the coronation scene at the crowning of King Edward VII. in 1902, and also finished his important series "The Quest of the Holy Grail," for the Boston Public Library, during the year. He was born in Philadelphia, April 1, 1852, and received his art education at the Pennsylvania Academy of Fine Arts. In 1871 he was engaged by Harper and Brothers as a staff artist, and in 1878 was sent by them to England, where he has lived almost continuously since. The first of his pictures to be exhibited at the Royal Academy was "A May Day Morning" (1890). Others of his notable works are "Fiametta's Song" (1894); the first part of the series of decorative panels for the Boston Library (1895); "Richard III. and the Lady Anne" (1896); "Hamlet" (1897); and "King Lear's Daughters" (1898). Besides these he has illustrated editions of *Herrick's Poems*, *She Stoops to Conquer*, the *Comedies of Shakespeare*, and other works. Mr. Abbey's work is characterized by its decorative quality, as well as by a graceful and romantic conception, especially in the illustration of Shakespeare and Goldsmith.

ABBOTT, EVELYN, English scholar and teacher, died at Malvern, England, September 7, 1901. He was born in England in 1843, and was educated at Balliol College, Oxford, where he graduated in 1866. He was elected a fellow of Balliol College in 1874, and subsequently became tutor and librarian, filling the office of classical moderator in 1883, and again in 1893-94. Mr. Abbott was extremely popular as a tutor and lecturer, and he gained a large influence over his students by his sympathy and interest in their work. He wrote much, principally on Greek philology and history. Among his works are, *Elements of Greek Accidence* (1874); *Index to Plato* (1875); *Hellenica: Essays on Greek Poetry, Philosophy, History and Religion* (1880); *A History of Greece* (1888); and a translation of Max Duncker's *History of Antiquity* (1887-91).

ABDURRAHMAN, or **ABDUL-RAHMAN**, Ameer of Afghanistan, died at Kabul, October 3, 1901. Eldest son of Afzul Khan and nephew of the late Ameer Shere Ali, he was born about 1830, and received a thorough economic and political training. In the civil war of 1864 he played a conspicuous part in his father's struggle to wrest the control of the country from Shere Ali, being in fact the organizer and director of these campaigns. Afzul Khan was placed on the throne in 1867, but proved incompetent and died from the effects of dissipation a year later, whereupon Shere Ali regained control of the government and Abdurrahman fled to Russia where he lived in seclusion. In 1879 Shere Ali died and was succeeded by his son Yakoub Khan, who was driven out by the British after a reign of less than a year, in punishment for the assassination of British envoys to his court. Seizing the opportunity thus afforded, Abdurrahman returned from retirement, and because of assistance rendered to the British and the eagerness of the latter to concern themselves only with affairs in India at that time, was recognized as Ameer by Great Britain and shortly afterward gained the submission of his subjects. Throughout his reign Abdurrahman governed with unusual vigor and wisdom, nominally under the control of the British government, but actually retaining considerable independence. He was a vigorous political organizer, and enforced with a strong hand the laws for punishing illicit traders and gamblers. He reorganized the army, crushed out revolts against his power with unsparing severity, and by his efforts raised the social, industrial, and

agricultural welfare of the country to the greatest excellence it has ever known. He was succeeded by his son, Habibullah (*q.v.*).

ABRASIVES. The production of natural abrasives in the United States in 1899 and 1900 was as follows:

Material.	1899.	1900.
Oilstones, whetstones, etc.....	\$208,283	\$174,087
Grindstones	675,586	710,026
Buhrstones	28,115	32,858
Infusorial earth.....	25,302	24,270
Crystallized quartz.....	39,000	40,705
Garnet	98,325	123,475
Corundum and emery.....	150,600	102,715
Totals.....	\$1,225,211	\$1,205,073

Of the artificial abrasives, the value of the crushed steel produced for this purpose in 1900 was \$47,250. The quantity of carborundum produced in 1900 was 2,401,000 pounds, the value of which is not given. The imports of grindstones in 1900 were valued at \$92,581, while those of oilstones and whetstones amounted to \$39,306, and of buhrstones to \$28,904. Attempts are being made to find good stones for grinding wood pulp in the United States, and for this purpose the Peninsula and Tippecanoe grits of Ohio sandstone are being used. Pulp stones are broader than grindstones, and those now in use have been imported from Newcastle-on-Tyne, England. The imports of these stones in 1900 amounted to 553 tons, an amount which was probably exceeded in 1901. Among the recent publications dealing with abrasives is one by J. H. Pratt on the abrasive materials of the United States, *Mining and Metallurgy*, xxiv, p. 347, 1901.

ABYSSINIA, an independent country of eastern Africa, separated from the sea by Eritrea and French, British and Italian Somaliland. The capital is Adis Ababa.

Area and Population.—Abyssinia proper consists of four provinces, Tigré, Shoa, Amhara, and Godjam, the combined area of which is estimated at 100,000 square miles; dependent territories aggregate some 50,000 square miles. Both of these estimates are perhaps too small. It was reported in the fall of 1901 that the boundaries between Abyssinia and the Egyptian Soudan had been fixed; the only Abyssinian frontiers remaining undetermined were in the region of Lake Rudolf and the Juba valley; and in November it was stated that the British government had despatched engineers to survey a proposed boundary in these districts. The population is estimated at about 3,500,000. There are few towns of more than 5,000 inhabitants; Harar, however, has a population of about 35,000. The state religion is Christianity. Education, which is in the hands of the clergy, is not in an advanced condition.

Government, etc.—In 1889 the King of Shoa became the ruler of all Abyssinia under the title of Emperor Menelek II. He is practically an absolute monarch, but maintains a sort of feudal political system with the *rases*, or princes, under whom are governors of districts and chiefs of villages. The most important *rases* constitute a state council. Besides territorial troops and irregulars there is an army of 150,000 men made up of contingents from the several provinces.

Industries, Commerce, etc.—To a small extent the inhabitants engage in agriculture, but the raising of cattle and sheep is the principal industry. The imports consist chiefly of cotton and woollen goods, cutlery, glassware, matches, provisions, and arms. In the fiscal year 1900 the imports and exports at Harar, the commercial centre of the country, were estimated at 3,822,650 dollars and 2,691,000 dollars respectively. (The Abyssinian silver dollar is worth about fifty cents in United States money.) Customs duties are imposed on both imports and exports.

A railway from Jibouti, on the coast in French Somaliland, to Harar, 186 miles distant, is under construction; the line has entered Abyssinian territory, and on December 17, 1901, was completed to the 125th mile. In 1901 a telegraph line was projected between Massowah, on the coast of Eritrea, and Adis Ababa, and a tramway between the latter town and Adis Halem.

Foreign Influence.—For some time it has been felt that Franco-Russian influence is in the ascendancy in Abyssinia. Several years ago King Menelek appointed the Russian adventurer, Count Leontieff, and a French prince governors of his equatorial province. This appointment, according to a report published in April, 1901, had been reaffirmed, as far as M. Leontieff was concerned, who after an absence from Abyssinia was returning thither to take command of the forces to be raised in the equatorial province. Gold was recently discovered in that province, and in June, 1901, an associate of Leontieff's, Baron de Chedeuvre, sailed from France with a number of engineers to explore the fields. On the other hand British influence

seemed to be on the increase in 1901. It was reported that several English companies had arranged to provide funds for a railway to connect Adis Ababa with the coast. For the military alliance, which is more significant, between British and Abyssinian troops, and the operations in the field, see **SOMALILAND**.

ACADEMIE FRANCAISE, founded in 1635 by Cardinal Richelieu and reorganized in 1816, is the first and most eminent of the academies forming the Institute of France (*q.v.*). It is composed of forty members (known as the "forty immortals") who are elected for life, after personal application and the submission of their names to the head of the state. The members receive an annual stipend of 1,500 francs, the permanent secretary 6,000 francs, and 6 members on the dictionary committee receive each annually besides 1,000 francs for their work. The Académie has also the disposal of a prize of 12,000 francs annually, alternately for poetry and eloquence, besides a number of smaller prizes. The chief office is that of the permanent secretary; the present incumbent is Marie Louis Antoine Gaston Boissier, who was elected to the Académie in 1876 and has a life tenure of his position. The Académie meets twice a week at the Palace Mazarin, 23 Quai Conti, Paris. Two members were elected in 1901, viz.: Charles Jean Melchior, Marquis de Vogüé, to succeed the Duc de Broglie, and M. Edmond Rostand to succeed M. Bornier. A chair in the Académie is the ambition of the literary men of Paris.

ACADEMY OF MEDICINE, AMERICAN, founded partly with the object of encouraging intending physicians to pursue a regular course of study leading to a bachelor degree before entering on the study of medicine and partly for the investigation of various problems of medical sociology. Membership, honorary and active, 634. President, Victor C. Vaughan, University of Michigan; secretary and treasurer, Charles McIntire, M.D., Easton, Pa.

ACADEMY OF POLITICAL AND SOCIAL SCIENCE, AMERICAN.
See **POLITICAL AND SOCIAL SCIENCE, AMERICAN ACADEMY OF**.

ACETOSPYRIN is a new salicylic compound which, unlike other salicylates, is insoluble in the gastric juice, but readily soluble in the intestinal secretions. It is a combination of aspirin (aceto-salicylic acid) with antipyrin, and occurs as a white, crystalline powder, with a slight acetic odor, and is almost insoluble in cold water. It has been used by Winterberg in the General Hospital in Vienna with great success in cases of rheumatism.

ACTINOTHERAPY. See **PHOTOTHERAPY**.

ADAMS, HERBERT BAXTER, American educator and historian, died at Amherst, Mass., July 30, 1901. He was born at Shutesbury, Mass., April 16, 1850, graduated at Amherst College in 1872, and received the degree of Ph.D. at Heidelberg in 1876. Upon his return from Germany he became a fellow (1876) at the newly established Johns Hopkins University, and in a few years assumed charge of the departments of history and political science, a position he held until failing health compelled his resignation a few months before his death. From 1884, the year of its organization, Professor Adams was secretary of the American Historical Association, in the foundation of which he took a leading part. Early in his university career he founded the *Johns Hopkins University Studies in Historical and Political Science*, and edited, with fine judgment, some forty volumes in the series. From 1887 he edited the series of *Contributions to American Educational History*, published by the United States Bureau of Education, and was also a contributor to it. The *Life and Writings of Jared Sparks* (1893) was his only published book, but among his many important monographs may be mentioned *The Germanic Origin of the New England Towns*; and *Thomas Jefferson and the University of Virginia*.

ADEN, a territory in southwestern Arabia about 100 miles east of Bab-el-Mandeb. The total area, including the small island of Perim, is 80 square miles; the population (1891), 41,910. Aden is a dependency of the Bombay Presidency and is administered by a British political resident, who is commander of the troops; it is a point of British protection over the neighboring Arab tribes which are independent of Turkish rule. Aden is an invaluable British possession, since it affords an important coaling station and practically commands the entrance to the Red Sea, thus protecting the trade with India. The commerce is almost entirely in transit. Imports and exports in the fiscal year 1899 amounted to 41,694,011 rupees and 33,289,895 rupees respectively; in 1900, 43,264,556 rupees and 35,244,515 rupees respectively.

On July 14, 1901, an expedition numbering about 500 British and Indian troops under Colonel Harrison left the port of Aden for Al Dareja, about seventy miles inland, to destroy a fort built by Turks under Mahomed Nussar in the territory of the Haushadi, who are under British protection. Although the Porte disowned the act of the Turks, the Haushadi were unable to obtain possession of the fort, and

hence the Indian government interfered. After overcoming some opposition the British force destroyed the fort in the latter part of the month. It was announced in November, 1901, that Great Britain had accepted in principle the proposal of the Porte for the appointment of a mixed Anglo-Turkish commission to mark the boundary between the hinterland of Aden and the vilayet of Yemen.

ADRENALIN is the name given to the active principle of the suprarenal gland by Takamine, of New York, who isolated the new drug in 1900. It is claimed to be the most powerful astringent and hemostatic known. One drop of a solution of Adrenalin in water, of the strength of 1 to 10,000, will blanch the normal conjunctiva in from one-half to one minute. Takamine states that the intravenous injection of 0.000016 gramme of Adrenalin chloride in a dog weighing 30 pounds raised the blood pressure to nearly nine millimeters of mercury. It is thus 625 times stronger than suprarenal extract. It is not irritating, poisonous, cumulative, or injurious. It has a wide range of applicability in treatment of the eye and of the nose, and has already proved useful administered internally in asthma, laryngitis, Addison's disease, exophthalmic goitre, and in certain heart diseases. Reichert, of Philadelphia, has experimented successfully with Adrenalin in opium and morphine poisoning, in collapse during anæsthesia, and in allied conditions where circulatory failure exists. He finds that it has prompt and positive action upon the respiratory movement of the heart, the arterial pressure, general metabolism, and the body temperature. Adrenalin is described as a light, white crystalline substance, with a slightly bitter taste and a numbing influence on the tongue; stable when dry; slightly soluble in cold water, though readily soluble in hot, and with a faint alkaline reaction. See SUPRARENAL EXTRACT.

ADULTERATION. See FOOD.

ADVANCEMENT OF SCIENCE, AMERICAN ASSOCIATION FOR THE, was organized in 1848 and has a membership of over 3,000, including some of the best known scientific men in the country. About fifteen leading scientific associations are affiliated with the association, which serves as a centre for the meetings of these societies. The association meets in sections which cover the field of science. These are: (a) Mathematics and Astronomy; (b) Physics; (c) Chemistry; (d) Mechanical Science and Engineering; (e) Geology and Geography; (f) Zoology; (g) Botany; (h) Anthropology; (i) Social and Economic Science; (k) Physiology and Experimental Medicine. The annual meetings of the association are held each time in a different city, the last six meetings having been held at Buffalo, Detroit, Boston, Columbus, New York, and Denver. The next meeting will be held June 28-July 3, 1902, at Pittsburg, Pa., at which Professor Asaph Hall, Cambridge, Mass., will preside. At the New York meeting, by unanimous vote of the council, it was decided to send *Science*, a scientific journal of 2,000 pages, free to members beginning January, 1901. The Association for the Advancement of Science held its fiftieth annual meeting at Denver, Colo., during the week commencing August 24, 1901, under the presidency of Professor Charles S. Minot, of Harvard University. This was the first meeting held west of the Mississippi River, and was well attended. There were ten sections represented and two hundred and twenty papers read at the meeting. The address of the retiring president, Professor R. S. Woodward, of Colorado University, was mainly devoted to the consideration of *The Progress of Science*. Professor C. R. Van Hise read a paper on *The Geology of Ore Deposits* and Mr. Gifford Pinchot, chief of the Bureau of Forestry, on *Irrigation and Forestration*. In the section of Chemistry, Professor J. H. Long, of Northwestern University, delivered an address on the development of the teaching of chemistry in the United States. In the section of Mechanical Science and Engineering, John H. Brashear, acting chancellor of Western University, of Pennsylvania, described plans drawn for the Carnegie Technical College in Pittsburg, which will call for an endowment of from \$10,000,000 to \$20,000,000. In the section of Zoology, Professor Charles B. Davenport, of the University of Chicago, discussed the quantitative study of variation, and in the section of Anthropology, Amos W. Butler, of the Indiana State board of charities, described the methods applied under his direction to the care of the feeble-minded, with some scientific deductions on heredity. In the section of Social and Economical Science, Professor C. M. Woodward, of Washington University, St. Louis, read a paper on *A Change of Front in Education*. A new section of the Association devoted to physiology and experimental medicine was organized, and will hold its first meeting for the reading of papers in 1902. President, Professor Charles S. Minot, Harvard University; permanent secretary, L. O. Howard, Washington, D. C. See ZOOLOGICAL SOCIETIES.

ADVANCEMENT OF SCIENCE, BRITISH ASSOCIATION FOR THE.
See BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE and ZOOLOGICAL SOCIETIES.

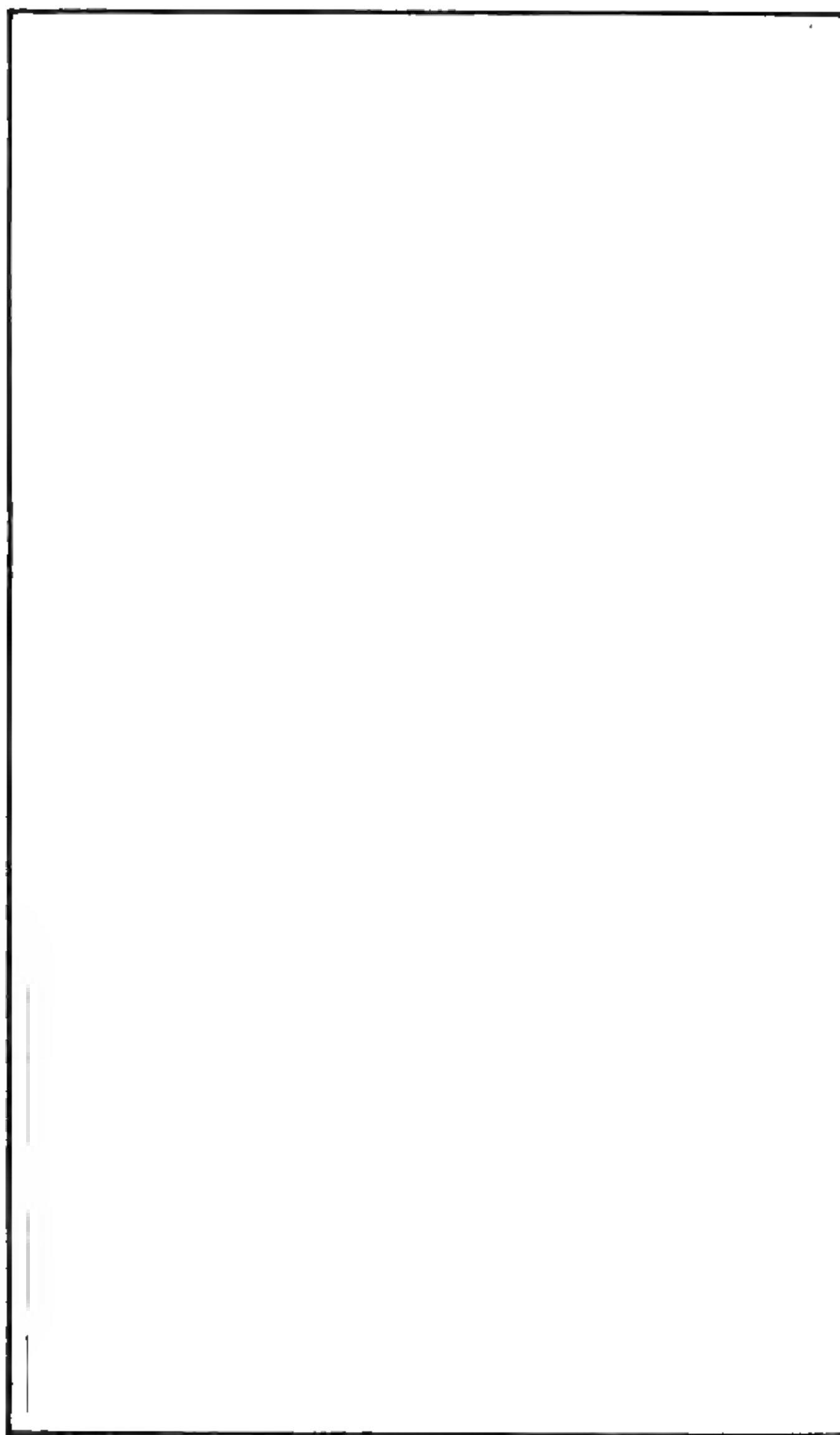
ADVANCEMENT OF SCIENCE, FRENCH AND SOUTH AFRICAN ASSOCIATIONS FOR THE. See ZOOLOGICAL SOCIETIES.

ADVENTISTS, popularly known also as Millerites, a name derived from that of their founder, have, according to late statistics, 88,705 communicants, 1,505 ministers, and 2,286 churches included in the following six branches: Evangelical, Advent Christians, Seventh Day Adventists, Church of God, Life and Advent Union, and Church of God in Jesus Christ. In numerical strength the Advent Christians, with over 25,000 members, rank next to the Seventh Day Adventists.

Seventh Day Adventists, organized in 1844, have a membership of 75,767 (nearly 60,000 in the United States), with 510 ministers, and 1,892 churches. This body, whose headquarters are at Battle Creek, Mich., maintains 5 colleges, 12 academies and industrial schools, and 10 publishing houses. There are 45 or more conferences throughout the world, and the missionary work, carried on in some 40 fields, covers an extensive territory. A system of parochial schools has been projected in the interests of which an educational conference and summer school was convened at Lake Gognac, near Battle Creek. During the first six months of 1902, four important union conferences will be held in various parts of the United States, and later the General European Conference will meet in London, England.

AERIAL NAVIGATION. Renewed attention was called to the problem of aerial navigation during 1901 by the experiments made with a dirigible balloon by M. Santos-Dumont, a young Brazilian, resident in Paris. Indeed it was publicly proclaimed by the French newspapers, because of these experiments, that a final solution of this fascinating problem had been devised. This claim certainly cannot be allowed, and it is not at all plain to experts in aeronautics from the facts so far made public that M. Santos-Dumont has established a right even to the claim of having advanced the dirigible balloon to greater perfection as a device for navigating the air than it already possessed. A brief summary of previous experiments with dirigible balloons will present some exact facts with which to compare the results obtained by this latest experimenter. The evolution of the dirigible balloon began in 1852, when Gifford ascended in one 144 feet long, equipped with a 3 horse-power steam engine weighing 462 pounds, and attained an independent speed of 6.71 miles an hour. In 1872 Dupuy de Lôme ascended in a balloon 118 feet long and attained a speed of 6.26 miles an hour, with man power. In 1884 Tissandier attained a speed of 7.82 miles an hour in a balloon 92 feet long equipped with an electric motor of 1½ horse-power, weighing 616 pounds. A year later, in 1885, Renard and Krebs, using the balloon *La France*, 165 feet long, provided with a 6 horse-power electric motor, is said to have attained for an instant a speed of 17 miles an hour. The last Schwartz, with a balloon 157 feet long equipped with a 16 horse-power benzine motor is said to have attained for an instant a speed of 17 miles an hour. The last of the experiments to be noted before coming to those of M. Santos-Dumont is that of Count Zeppelin, made in 1900, with a balloon 480 feet long and 39 feet in diameter, provided with two benzine motors of 32 horse-power, and weighing 1,430 pounds. With this balloon, its designer attained a maximum speed of 18 miles an hour. Both Renard and Krebs and Count Zeppelin were able with their machines not only to maintain the independent speeds in direct flight which have been stated, but also to beat against the wind and to turn at will and describe loops and circles in the air. Turning now to the experiments of M. Santos-Dumont, it may be stated at the outset that the work which culminated in the notable flight of 6½ miles around the Eiffel Tower in 1901 was begun in 1898. The first balloon, which was built in 1898, was in the form of a cylinder terminated at each end by a cone; it was 82 feet long, nearly 6 feet in diameter, and could lift 450 pounds, including its own weight of 66 pounds, or about 380 pounds net load. Beneath the balloon was suspended a light basket containing the propelling machinery and accommodations for the aeronaut. The motor was of 1½ horse-power, operated by gasoline. To trim the balloon fore and aft so as to ascend and descend a bag of ballast was attached to a rope hung from the fore part or the after part, tilting the balloon up or down as desired. The first serious attempt at flight with this machine came near being fatal to the aeronaut. To compensate for the condensation and dilatation of the gas in the balloon by changes of temperature, the inventor had placed a small compensating air balloon inside the gas balloon, which by means of an air pump could be inflated and deflated at will. In the first flight the air pump failed to work, and the gas balloon became flabby through condensation and began to double on itself and finally fell. Through sheer good luck no damage resulted to the aeronaut. Previous to the accident the operator had thorough control of his machine and was able to manœuvre it in circles and loops at will. The second balloon built by M. Santos-Dumont was similar in construction to the first, but was somewhat larger. No ascension was made with this balloon, as the inventor had come to the conclusion that a change in model was desirable. Balloon No. 3 was accordingly constructed in 1899,

with a length of 66 feet and a diameter, at its greatest section, of $11\frac{1}{2}$ feet. In it illuminating gas took the place of hydrogen, and the compensating air balloon was omitted altogether. As a precaution against the balloon doubling on itself, a 30-foot bamboo pole was fixed lengthwise to the suspension cords above the car and beneath the balloon. The first trip made with this balloon is thus described by the inventor in an interview published in the *Century Magazine*: "On November 13, 1899, I started from Lachambre's atelier in Vaugirard with the No. 3 on the most successful trip I had yet made. From Vaugirard I went directly to the Champ de Mars, over which I practised describing figure 8's. The air-ship obeyed the rudder beautifully. After circling round the Eiffel Tower a number of times, I made a straight course to the Parc des Princes at Auteuil; then, making a hook, I navigated to the manœuvre-grounds of Bagatelle, where I landed." In this balloon the motor proved too weak, and the whole machine was found to be clumsy. Balloon No. 4 was built in 1900. It was 95 feet long and 9 feet in its greatest diameter. In place of the bamboo stiffening pole of No. 3, the inventor substituted a long, slender framework to which the propelling and controlling machinery was attached and on which the operator sat in a seat like a bicycle saddle, there being no basket. The motor used was a $7\frac{1}{2}$ horse-power petroleum engine. Numerous trips were made with this balloon during the Paris Exposition period of 1900. The fifth balloon of M. Santos-Dumont was constructed by adding a section to the middle of No. 4 so as to increase its length to 109 feet. The stiffening frame or "keel" was a carefully designed framework of wood and metal and was 60 feet long. Into this "keel," 20 feet from the stern, was fixed a 16 horse-power petroleum motor, connecting it with the propeller by a long, hollow steel shaft. The operator's basket or car was located 23 feet from the front or stern of the "keel," and from it cords led to the various operating devices. The most important trip undertaken with this balloon was made on August 8, 1901, in competition for the Deutsch prize of 100,000 francs to be awarded to the first dirigible balloon or air-ship that, between May 1 and October 1, 1900, 1901, 1902, 1903, and 1904 shall rise from the Parc d'Aerostation of the Aero Club at St. Cloud, and without touching ground, and by its own self-contained means describe a closed circle around the Eiffel Tower and return to its starting point in 8 minutes 50 seconds, turned in 40 seconds, and was on his way to the starting point when the balloon became deflated and fell onto the roof of the Trocadero Hotel in such a way that the "keel" remained suspended and preserved the life of its occupant. A previous trial trip made with the balloon on July 12 is described as follows in *Engineering News* of July 18, 1901: "The balloon was steered from St. Cloud to the Longchamps race-course; this course was circled six times at an average speed of 25 miles per hour, and the machine was made to descend to the ground and rise again. The operator then started for the Eiffel Tower and owing to some slight accident he descended easily in the Trocadero Gardens and repaired damages. He then rose again, made a complete circuit of the tower and returned to Longchamps. Including stoppages, the voyage lasted 66 minutes. M. Santos-Dumont uses no ballast and yet easily maintained his altitude of from 100 to 270 meters." On July 13, the trip of the preceding day around the tower was repeated, the distance of seven miles from St. Cloud to the town and back, being covered in 39 minutes. To take the place of balloon No. 5, which was destroyed on August 8, 1901, M. Santos-Dumont built a longer and thicker balloon, the sixth one constructed by him. On October 19, 1901, the inventor undertook to win the Deutsch prize with this balloon. The results of this trip were described as follows in *Engineering News* of October 20, 1901: "The dirigible balloon constructed by Santos-Dumont succeeded on October 19 in making a trip from St. Cloud to and around the Eiffel Tower, and then back to the starting point in 30 minutes 40 $\frac{1}{4}$ seconds. The first part of the trip to the tower was with the wind, and was made in 8 minutes 45 seconds, but the return trip was against the wind and required 20 minutes 30 seconds to complete. The remaining 1 minute 40 $\frac{1}{4}$ seconds was consumed in descending. The trip was undertaken as the result of a prize of 100,000 francs offered the inventor should he succeed in making the journey in 30 minutes. According to the press despatches, the balloon pitched somewhat when going against the wind, and Santos-Dumont, when he descended, said the motor suddenly stopped while the balloon was at a little distance from the tower. He thought he might have to descend, but luckily he succeeded in getting the machine started again. From that time on the motor worked satisfactorily." To sum up briefly the experiments of M. Santos-Dumont, the following conclusions seem to cover all that has actually been accomplished: Several balloons have been built with which the inventor was able to ascend and descend and to turn around a fixed point at will; in all but a few trips some accident has occurred to the whole or a part of the balloon; of the two trips (July 13 and October 19) around the Eiffel Tower, which were accurately timed, the journey of seven miles was made once in 39 minutes and once in 30 minutes 40 $\frac{1}{4}$ seconds. These facts are truly notable, but it should not be



FLYING MACHINES.—Santos-Dumont, French (upper). Kress, Australian (lower)

forgotten that the dirigible balloons of Renard and Krebs in 1884, and of Zeppelin in 1900 accomplished practically the same results. In 1901 M. Deutsch began the construction of a dirigible balloon to be operated by a motor of 60 horse-power, by far the most powerful engine that has as yet been actually planned for a flying machine of any sort.

AFGHANISTAN. A monarchy lying east of Persia, between Russian Turkistan and British India. The capital is Kabul.

Area and Population.—The total area of the four provinces, Kabul, Herat, Turkistan, and Kandahar, and the Badakshan district, comprising Afghanistan, is something over 215,000 square miles, and the population about 4,000,000. The inhabitants do not form a homogeneous nationality, but comprise several races or tribes; most of these, however, are united in religion—that of the Suni sect of the Mohammedans.

Government, etc.—Government is directed by the Ameer, whose will theoretically is absolute. From 1880 to 1901 the Ameer was Abdurrahman (*q.v.*), grandson of Dost Mohammed, the founder of the present dynasty. Abdurrahman died October 3, 1901, and was succeeded by his eldest son, Habibullah Khan. Afghanistan is practically under British influence; it has no foreign relations except with the government of British India, maintaining a political agent at Calcutta and accrediting a British resident (who must be a Mohammedan) at Kabul. The provinces are administered by governors. Extortion and dishonesty prevail in the collection of taxes; the amount of the annual public revenue is unknown. The ameer receives from the Indian government an annual subsidy of 18 lakhs of rupees (£120,000). The strength of the army is estimated at 44,000 men; the late ameer declared that at any time he could put into the field 100,000 trained soldiers. The military equipment, which is ample and of good quality, is supplied by the factories established by Abdurrahman at Kabul.

Industries and Commerce.—The inhabitants give considerable attention to agriculture, raising cereals, lentils, fruits, etc. Various minerals occur but are little developed. Manufactures include silks, carpets, and articles made of camels' and goats' hair. Statistics of commerce are not available, but the total annual trade with India is estimated at £800,000. The leading imports include cotton goods, dyeing materials, sugar, and tea; the exports: asafoetida, grain, horses, wool, silk, cattle, and hides.

History.—Abdurrahman's death, though reported on October 3, 1901, is said to have occurred two days earlier and been concealed by his successor to insure a peaceful accession to the throne. Habibullah Khan, "the Beloved of God," chosen by the late ameer, succeeded him, apparently without opposition from his brothers, and was favorably received by the people. The new ameer did not come into power without knowledge of rule; for several years he had been intrusted with the administration of important state affairs, and early in 1901 his duties were increased. His father, who practically made Afghanistan what it is to-day—a country of definite boundaries with a comparatively strong central government and an army able to defend them—was more feared than loved by the people. The new ameer is a man of gentler disposition than his predecessor, and in spite of his assurance that he would follow in the latter's footsteps, it was expected that his rule would show more leniency and effect various reforms. Shortly after his coronation he raised the pay of the soldiers, released certain prisoners from the jails throughout the country, and promised a reduction of taxes. There were indications that he would attempt to revive the former flourishing trade with India, which Abdurrahman's fiscal policy had largely destroyed. Since Afghanistan is a buffer state between the British and Russian empires, it has a large political significance, and the Afghan succession was, before Abdurrahman's death, a subject of much concern. The belief has been common that Russia did not favor Habibullah, but that government gave no evidence of such feeling on his accession. The new ameer was born at Samarkand in 1872, his mother being the daughter of the Mir of Badakshan. He is allied, through his wives, with several of the important chiefs of Afghanistan.

In 1901 Mr. Frank A. Martin, engineer-in-chief for the Afghan government since 1895, was engaged in extensive engineering works; canals and other irrigation works were in process of construction near Kabul, and an important road was being built toward the Oxus. In that district, it was reported, Abdurrahman had been erecting a number of forts, "well equipped with the most modern appliances, including electric searchlights." At the same time it was stated that he had ordered several heavy Krupp guns, while a nearly maximum amount of work was being done in the Kabul workshops, the output including smokeless powder.

AFRICA. So large a part of Africa is not known sufficiently well to admit of even approximately accurate estimates of area and population that figures for the area of the continent as a whole and its total number of inhabitants are little better

than guesses. The estimates of the several divisions that on the whole appear to be most trustworthy show an aggregate area of about 11,604,000 square miles and a population of about 156,780,000.

Independent Africa comprises Morocco, in the northwestern corner of the continent, Abyssinia in the east, Liberia in the west, and the Congo State in the central equatorial region. The total area of these territories is placed at 1,344,000 square miles and the population 39,000,000. It should be noted that the Congo State, so far as native influence is concerned, cannot be regarded as really independent.

One of the distinctive features of the close of the nineteenth century was the partition of Africa among the European powers. British territory, that is, colonies, protectorates, etc., includes Gambia and Sierra Leone, on the Atlantic, Gold Coast, Lagos, and Nigeria on the Gulf of Guinea, a part of Somaliland on the Gulf of Aden, the immense region extending from the Cape of Good Hope to Lake Tanganyika, and the still larger region extending from Egypt (the 22d parallel) to Victoria Nyanza and the Indian Ocean. The total estimated area of these territories is about 3,031,000 square miles and the population about 52,647,800. Egypt also, with about 400,000 square miles and 9,734,000 inhabitants, is practically under British influence. During 1901 the policy of the British government toward its African colonies and protectorates was severely criticised. It was alleged that, after new territory had been placed under British supremacy and some form of administration instituted, little further attention was given thereto by the imperial government. Imperial subventions, when not evaded, were made as small as possible, and often paid in such small instalments that they fell far short of meeting the real needs of the dependencies. As results of this "unintelligent parsimony" there were cited such disasters as the mutiny of the unpaid Soudanese troops in Uganda, and numerous outrages necessitating punitive expeditions. When so serious a thing as mutiny occurs, the government is ready to expend any amount of money needed to set matters right again; then affairs, it is held, are allowed to slip back to the same old channels. Adverse criticism was made against a colonial office that allows its colonial administrators to remain almost alone among savage and hostile tribes. In commenting upon the frequent murders of such unprotected officials, a writer said: "At once there is a punitive expedition organized; valuable lives are lost; a couple of hundred thousand pounds are spent; the natives are 'punished,' and the supplementary estimate necessitated by the 'little war' is made the excuse for exercising a still more rigid economy than the ordinary estimates for the protectorate." The *London Times* said editorially: "A penny-wise and pound-foolish policy is tolerated in the management of the greatest machine of government that the world has ever seen."

British efforts in African colonization, however, are distinctively more successful than French and German. French Africa extends from Algeria and Tunis southward, touching at various points the Atlantic and the Gulf of Guinea north of the equator and the Atlantic again south of the equator. In addition, France holds a small part of Somaliland. The total estimated area is about 3,326,000 square miles and the population about 32,682,000. In this territory French rule has been most successful in Algeria, which, it should be pointed out, is regarded administratively as an integral part of France.

German Africa includes Togoland on the Gulf of Guinea; Cameroon, extending from that body of water to Lake Tchad; German East Africa, lying between Lake Tanganyika and the Indian Ocean, and German Southwest Africa, bordering the south Atlantic. The total estimated area is 930,760 square miles and the population over 12,300,000. Thus far German colonial progress in Africa has been decidedly disappointing. The German population of these territories is surprisingly small, amounting to only a few thousands. The Germans seem to have a genius for commerce, but not for permanent settlement in new and undeveloped lands; and where German immigration is large, as in the United States, the newcomers readily lose political affiliations with the Fatherland. In addition to the inherent difficulty in the problem of German colonization, the projects of the Berlin government are further impeded, and seriously, by opposition in the *Reichstag*. This body refuses to vote the needed subsidies and guarantees for colonial works. This is conspicuously true with regard to the projected railways of German East Africa, the construction of which became in 1901 all the more important, from the German point of view, by the completion of the Uganda railway in British East Africa.

Portuguese territory includes the large colonies on the east and west coasts of southern Africa and the small colony of Portuguese Guinea bordering the north Atlantic. The total estimated area is about 790,000 square miles and the population 8,059,000. During 1901 fears were expressed in some quarters that the British advance in South Africa is destined to absorb, at least in part, the East African possessions of Portugal.

Italian Africa comprises Eritrea, on the Red Sea, and a portion of Somaliland, the extreme eastern part of the continent, the combined area of which is estimated



at 188,500 square miles and the population 950,000. Though Italy has been conspicuously unsuccessful in Africa colonization, she seems intent on further enterprise. It is certain that she covets Tripoli and Benghazi, which she hopes to transform into a kind of Italian Algeria. During 1901, and especially toward the close of the year, a Franco-Italian agreement was rumored, whereby French influence would dominate the Tripolitan hinterland and Italian rule would be instituted in Tripoli and Benghazi proper. This alleged agreement occasioned no little surprise, since the attitude of the Sultan of Turkey, in whose dominions the country is included, was apparently left out of the question.

Spanish Africa consists principally of Rio d'Oro, on the Atlantic south of Morocco, and a small district on the Gulf of Guinea. The area of the latter is stated at 1,000 square miles, and of the former 243,00 square miles. The actual area of Rio d'Oro, however, will doubtless prove to be much smaller when the boundary determined by the Franco-Spanish convention of 1900 is finally demarcated. The population of Spanish Africa is estimated at only a little over 100,000. See FERNANDO PO.

Turkish Africa comprises Egypt and Tripoli, including Benghazi. The total estimated area is about 799,000 square miles and the population upwards of 11,000,000. Though not nominally, Egypt is practically a British protectorate.

Events of 1901.—As in 1900 the most striking events in Africa in 1901 were connected with the Anglo-Boer war, which is treated in the article TRANSVAAL. But other military operations of more or less importance were carried on during the year. A punitive expedition on the part of the British, who were for a time assisted by French troops, was carried out in Gambia. British punitive expeditions also took place in both Northern and Southern Nigeria, in British East Africa, and in Somaliland, where a joint Anglo-Abyssinian campaign was carried on against the "Mad Mullah." In the French Soudan the French suppressed the uprising of an Arab tribe near Lake Tchad and defeated the remnant of Rabah's forces. In the Ogowe region of French Congo, a revolt of some 18,000 Pahuins took place, and in Wadai a rebellion broke out resulting in the assassination of the native sultan of that state. Uprisings occurred in the Congo Free State, in Algeria, and in Morocco.

A considerable number of exploring and surveying parties were at work in 1901. More accurate surveys, even in the better known parts of Africa, are a recognized need. During 1901 the region between the Sobat and Lake Rudolf was explored by Majors Austin, Bright, and Garner. The expedition, which proceeded across British East Africa, reaching Mombasa in September, suffered severely from the want of water and supplies. The frontier of the Egyptian Soudan was surveyed by Major Gwynn. In the Galla region south of Abyssinia work was carried on by Baron von Erlanger and Herr Oskar Neumann, who have added considerably to the geographical knowledge of that part of Africa. Corrective surveys of Victoria Nyanza have been made, and in Uganda Sir Harry H. Johnston made a number of journeys which resulted in important zoological discoveries (see MAMMALOGY). A German-Belgian expedition conducted surveys in the region of Lake Kivu, and districts further to the west were explored by Commanders Siffer and Sillye. Explorations were also carried on in West Africa; MM. Huot and Bernard were at work in northeastern French Congo and M. Lesieur nearer the coast. In northern Cameroon expeditions were conducted by Captain Ramsay and Captain Schimmelpfennig, and in the southeastern part of the territory by Lieutenant von Stein. In southern Morocco there were expeditions under Professor Fischer and under Mr. Bishop, and in Tripoli under M. Malthuisieulx.

For details of the various parts of Africa, see the articles on the several countries; also CAPE-TO-CAIRO RAILWAY, and, for commerce with the United States, UNITED STATES (paragraph Commerce).

AFRICAN METHODIST EPISCOPAL CHURCH. See COLORED METHODISTS.

AFRICAN METHODIST EPISCOPAL ZION CHURCH. See COLORED METHODISTS.

AFRICAN TRANSCONTINENTAL TELEGRAPH LINE. See CAPE-TO-CAIRO RAILWAY AND TELEGRAPH.

AGARDH, JACOB GEORG, Swedish botanist and for many years a professor in the University of Lund, died January 17, 1901. Professor Agardh was born at Lund in 1813, and was educated at the University in that town, where he became professor in 1874. He was one of the greatest phycologists, authorities on sea-weeds, the great work of his life being the *Species, Genera, et Ordines Algarum*, which, begun in 1848, was finished in 1876. He was also the author of *Till Algernes Systematik* (1872-1890), and numerous other valuable works dealing with sea-weeds.

AGASSIZ, ALEXANDER, the American scientist who was elected president of the National Academy of Sciences in 1901, was born at Neuchâtel, Switzerland, December 17, 1835, the son of Professor Louis Agassiz, the famous naturalist. Removing to the United States with his father in 1849, he graduated at Harvard in 1855, and at the Lawrence Scientific School two years later. As assistant on the Coast Survey he went to California in 1859, and in 1860 he was made an assistant in the Museum of Comparative Zoology at Cambridge, a position which he retained until 1865. Then he made a venture in coal mining in Pennsylvania, which led to his connection with the development of the Calumet and Hecla Copper Mines on Lake Superior, from which he gained a large fortune. The years from 1865 to 1869 he spent at the mines, and then devoted a year to studying the museums of Europe, returning to take the position of assistant curator of the museum at Cambridge, and upon the death of his father in 1873 he became curator. In 1885 he resigned this position on account of ill health, after valuable work in developing the museum, and retained only an unofficial connection with the institution. Mr. Agassiz has spent much time with the Coast Survey in deep-sea dredging, and has headed a number of scientific expeditions. Among his publications are *Marine Animals of Massachusetts Bay* (with Elizabeth Agassiz, 1871), *North American Acalephæ* (1865), *Revision of the Echini* (1872), *North American Starfishes* (1877), *Report on the Echini of the Challenger Expedition*, and numerous monographs on deep-sea fishes.

AGRICULTURE. The season of 1901 was an unusually prosperous one for agriculture, considered as a whole. The wheat crop was one of the very largest, if not the largest, which this country has produced, and the prices, which depend upon the world's supply, were good, so that the total value of the crop of this country is placed at \$150,000,000 above that of the preceding year. There was a falling off in the cotton crop in a number of States, which brought the total yield down considerably below the average. The oat crop was a fair one and has commanded high prices. The corn crop was the disaster of the year, owing to a severe drought during the early summer. The total yield is estimated at nearly or quite 700,000,000 bushels below the average. The potato crop was short, and making necessary an unusual importation. The high prices, however, made up for the deficit. The prices of farm crops in general were very good, owing in part to the shortage of corn, which increased the demand for all sorts of feed stuffs. The *American Agriculturist* estimates the total value of the farm crops at \$400,000,000 over that of the preceding year. The shortage of the corn crop forced the heavy marketing of stock from the drought districts, and the high prices have tempted many farmers to ship their stock. There was an active market for animals and animal products throughout the year at satisfactory prices.

Plant Production.—The progress in plant production has been chiefly along the lines of greater diversification, more intensive cultivation, and the improvement, introduction, and management of new crops, from which has resulted a remarkable advancement in agricultural industries. This has been promoted by the efforts of the national Department of Agriculture to seek out and introduce plants or varieties better adapted to the conditions of different sections of the country, and to build up new industries, and by the great activity that there has been in the scientific improvement of plants by breeding and selection. In the plant-breeding work which is carried on by the Department of Agriculture and a number of the agricultural experiment stations, the effort is either to improve the quality or productibility of the plant, or to produce a strain or variety more resistant to unfavorable environment conditions or serious insect ravages. A great deal has already been accomplished with wheat, corn, cotton, and other staple crops, and the work is expected to exert a profound influence on agriculture. The Illinois Station has improved the quality of corn and the Minnesota Station has given to that section several varieties of wheat and corn which are more productive than the common varieties and possess more desirable qualities. In Illinois and Iowa organizations have been formed among farmers, who, under the instruction of their experiment stations, are engaged in breeding corn, establishing distinct types, and growing seed corn in accordance with scientific principles.

The macaroni wheats which the Department of Agriculture has introduced and disseminated have been found well adapted to a wide extent of territory in the West and Northwest. In 1900, when other wheats were almost a complete failure in the Dakotas, the macaroni varieties produced a good yield and grain of excellent quality, and these results were confirmed during 1901.

The rice industry in Louisiana and Texas has developed very rapidly during the past few years, not less than \$20,000,000 being now invested in that industry. During the past two years there has been an increase in the rice production of nearly 75,000,000 pounds, which has been accompanied by a falling off in the importation of rice of nearly one half. The rice is there grown under irrigation, the water being

pumped from wells or streams for that purpose. It is believed that in a few years this country will not only cease to import rice, but will be exporting it.

Great interest has been aroused, especially in 1901, in the reclamation and improvement of the ranges of the West and in finding or breeding forage plants adapted to them. The great success which has attended the trial of smooth brome grass (*Bromus inermis*) has led to the planting of this on a large scale in certain sections. While this is partly due to the demand for seed, many farmers are planting tracts of 50 to 100 acres for the production of hay.

The growing of tea in South Carolina is a demonstrated success. About 4,500 pounds of high-grade tea were produced at Summerville, S. C., in the season of 1901, for all of which a ready market was found in the North. The labor conditions have been so far overcome that the profit on this crop averages from \$30 to \$40 an acre.

In connection with the various studies that have been continued on the sugar beet and its adaptation to different sections of the country, an extensive résumé has been made by the Department of Agriculture showing the influence of environment on the sugar content of the beet, especially the soil and seasonal influences which brings out a number of interesting points. Studies of the effect of environment on the gluten content of wheat have shown that even in the course of a single year the influence was so great as to cause a variation of 50 per cent. or more from the original gluten content, usually a decrease.

The growing of Sumatra tobacco under shade in the Connecticut Valley, which gave such favorable results in 1900, was continued on a larger scale in the following year, about forty acres being grown under proper supervision. The results were even more favorable than in 1900, and show conclusively that when properly managed a wrapper tobacco of high quality can be grown in this country at a good profit. About \$2 a pound was realized for the product at auction. A company has been organized which will plant 100 acres in 1902, and it is said that cloth has been contracted for to cover over 500 acres. In the curing of tobacco there has been great progress, coming from a better understanding of the nature of the fermentation and the conditions for the development of black rot and other unfavorable changes. Bulk fermentation has been shown to be very superior to the old method of fermenting in the case, both in improving the quality of the leaf and in controlling the dreaded black rot.

Soil Studies.—During 1901 a soil survey under the supervision of the Department of Agriculture was undertaken on an extensive scale. Beginnings have been made in a number of States, and the work will be vigorously prosecuted with a view to mapping the soil areas so as to show the different types of soils represented and to determining methods of soil management and cropping. A considerable amount of work has been done in studying the alkali of the West—the way in which it injures or prevents the growth of plants and the tolerance of different plants for it. The rôle of micro-organisms in the soil in rendering plant food available, decomposing organic matter, and nitrifying nitrogenous matter, is now better understood, and it is recognized that the real object of the cultivation of the soil is very largely the bringing about of conditions favorable to the activity of these beneficial organisms. These investigations have an exceedingly important bearing in shaping the practices of soil management.

The benefits of a rotation of crops in maintaining soil fertility, as compared with continuous wheat growing, have been forcibly brought home to the farmers of the Northwest during the past two seasons. The system of continuous wheat culture with summer fallow has been shown by Snyder at the Minnesota Experiment Station to result in heavy loss in nitrogen and humus, the loss of the latter changing the physical properties of the soil and causing it to be less retentive of moisture. Bare summer fallow, which is common in the wheat-growing regions of the Northwest, has been shown to cause a heavier loss in nitrogen than continuous wheat growing. A condition has been reached, both in the wheat lands of the North and the cotton fields of the South, where a system of rotation must be employed to secure good results. Experiments carried on for six years at the North Dakota Experiment Station show that continuous wheat culture is unprofitable, while wheat in rotation increases in yield and improves the fertility. Three crops of wheat and one of clover gave in four years almost as much wheat and more profitable returns than four successive crops of wheat. The results of the past two years have shown the marked advantage of rotation, and they are gradually having their effect in changing the practice and doing away with the wasteful summer fallow system.

Live Stock.—The census returns of the enumeration of farm animals, issued during 1901, show that the number of farm animals is increasing relatively more rapidly than the population, indicating an increased production of live stock in recent years. The effect of this has, however, not been apparent in the prices received. The prices of live stock in general have been good, and the report of the Union Stock Yards at Chicago shows the business of the past year to have been almost

unprecedented. The total number of cattle received at the yards, over 3,000,000 head, was larger than in any year since 1893. For the first time in the history of the yards the receipts of sheep and lambs reached the 4,000,000 mark, and the number of hogs exceeded 8,000,000. The stock received at the yards during the year represented an estimated value of nearly \$284,000,000, which was an increase of more than \$20,000,000 over 1900. There was a notable increase in the number of cattle and sheep exported from this country in 1901, the former being greater than in any year since 1898, and the latter the largest since 1896. The exports of animals and animal products during the year amounted to nearly \$254,000,000.

The discovery of a practicable method of immunizing northern cattle to Texas fever has led to the introduction of a large number of high-bred animals into the South for the improvement of the herds. In recent years a marked improvement has also taken place in the general character of the animals raised on the range, and in breeding beef animals to meet the demand. A notable instance of this improvement is found in the fact that at the Fat Stock Show at Chicago in December, 1901, the champion carload lot of fat steers were produced on a Texas ranch and were largely of Hereford blood. Another change in stock raising has come from the worn-out condition of the open range and the gradual selling and fencing in of the public domain. While there is much interest in the renovation and improvement of these ranges, time will be required to overcome the effects of the continued overstocking, and the changed conditions brought about afford encouragement for intelligent stock raising in the East. With the superior prices for high-grade beef, rapidly grown and of the type best suited to the butcher, the opportunity for profitable beef production in the East is believed to be good and the conditions more favorable to it than they have been for many years past.

The Russian government has taken steps in the direction of improving the character of the live stock and the live-stock industry of that country. An appropriation of \$2,000,000 was made in 1901 to begin this work, together with a regular appropriation for its continuance.

The exhibition event of the year was the Second International Live-Stock Exposition, held at Chicago early in December, which was one of the largest and most successful live-stock expositions ever held. Practically 12,000 animals competed for premiums amounting to \$110,000, and these were viewed by over 400,000 people. The exhibition animals included cattle, horses, sheep, and pigs. Among the beef cattle the Aberdeen Angus, which carried off the prizes last year, were this year outclassed by the Herefords. The grand champion of the show was a pedigreed Hereford steer, and the champion carload lot of steers, as mentioned above, was composed of grade Herefords. The latter brought at auction \$12 per hundred weight. The auction sales of breeding cattle brought some unusually high prices. A Shorthorn cow sold for \$6,000, a Hereford cow for \$4,500, a Galloway bull for \$2,000, and a Shorthorn bull out of the royal herd of England sold privately for the highest amount, it is stated, ever paid in America. A Berkshire boar sold privately at the remarkable price of \$2,500.

There has been renewed interest in the Angora goat, resulting in a considerable demand for this variety in those sections of the country which are suffering from the encroachment of brush and briars upon the farm and pasture lands. As the Angora produces annually a fleece worth from \$1.00 to 1.50, and its skin with the fleece attached is worth from \$1.50 to \$2.50, it would seem that Angora goat raising is likely to develop into a permanent industry in certain sections of this country.

The investigation in the line of animal production has continued along much the same lines as in previous years and has covered the whole range of commercial and home-grown feeding stuffs, the economical production of beef, mutton, and pork, using farm-grown feeds to a greater extent, and more intricate problems connected with the physiology of animal nutrition. In this connection it may be mentioned that a respiration calorimeter, which is the first apparatus of its kind for use with large animals, has been completed at the Pennsylvania Experiment Station, and experiments have been commenced with it in a preliminary way.

Literature.—Of the new literature of 1901, the following books may be mentioned: *Agriculture* (Volumes 1, 2, and 3), by William P. Brooks; *Agricultural Bacteriology*, by H. W. Conn; *Text-Book of the Physics of Agriculture*, by F. H. King; *Feeding of Animals*, by W. H. Jordan; *Judging Live Stock*, by John A. Craig; *Study of Breeds in America*, by Thomas Shaw; and *Breeds of Poultry*, by G. C. Watson.

UNITED STATES DEPARTMENT OF AGRICULTURE.

The great development of the administrative and scientific operations of the Department of Agriculture under the administration of Secretary James Wilson has necessitated its reorganization in accordance with the plan followed in the other departments of the National Government. Congress has therefore authorized the

establishment of four new bureaus: the Bureau of Plant Industry (comprising the former divisions of botany, vegetable physiology and pathology, agrostology, pomology, seeds, gardens and grounds, and the section of seed and plant introduction); and the Bureaus of Soils, Chemistry, and Forestry (taking the place of the former divisions of the same names).

The annual appropriation for the department for the fiscal year ending June 30, 1902, is \$3,862,420, exclusive of the regular appropriation of \$720,000 for the State agricultural experiment stations. The number of its paid employees is over 3,500, of whom more than 2,000 are engaged in operations connected with its scientific work. During the year 1901 it issued 606 publications, aggregating nearly 8,000,000 copies. The *Year Book* has an edition of 500,000 copies. Plans have been drawn for a new main building, provision for which is made in a bill now before Congress. Among the important advances in the work of the department during the past year are the following:

The Weather Bureau has established cooperation with Europe in the interchange of weather forecasts and has extended the distribution of forecasts to farmers through rural free delivery. Progress has been made in perfecting a system of wireless telegraphy for use in the weather service. Meat inspection is now maintained in fifty-one cities where nearly 37,000,000 animals were inspected in 1901. Investigations in plant breeding have been much extended and the problems of the improvement of the western ranges are being widely studied. Satisfactory results have been obtained in the growing of macaroni wheats, Egyptian cotton, the date palm, and tea. With the aid of the department, Sumatra tobacco is being successfully grown in the Connecticut Valley and Florida. The survey of soils of different States with reference to their agricultural capabilities has been greatly extended. Investigations on the adulteration of food products have been extended to include imported foods. The investigations on the nutrition of man include dietary, digestion, metabolism, and cooking experiments. The work in forestry has been enlarged to include the study of forests, forest fires, forest grazing, commercial trees, lumbering, and forest products for the Federal and State governments, and for private individuals. Expert assistance is being given in the management of forest reserves as well as of private forest lands. Much progress has been made in studies of the irrigation laws and institutions in the arid States and the distribution and use of water for different crops in both the arid and humid regions. The survey of the life zones and crop belts in the West has been continued in connection with which it has been ascertained that a species of agave grows in great abundance in Texas which may take the place of large quantities of fibre now imported, mostly from Mexico. The inspection of the importation of birds has been systematized under the provisions of the Lacey Act. The investigations which resulted in the introduction and establishment in California of the fig fertilizer insect (*Blastophaga grossorum*) have been completed and already a considerable amount of figs fertilized in this way have been put upon the market. The original home of the San José scale has, it is believed, been found in Northern China, where it is held in check by a lady-bird beetle (*Chilocorus similis*), which will be introduced into this country in the hope of thus repressing this pest. See FORESTRY.

AGRICULTURAL EDUCATION.

Considerable progress was made during 1901 in broadening and strengthening courses in agriculture in the colleges in the United States. The movement for the division of the general subject of agriculture into specialties to be taught by different instructors still continues. The Committee on Methods of Teaching Agriculture of the Association of American Agricultural Colleges and Experiment Stations completed its syllabus for the college course in agriculture. This divides the subject of agriculture into agronomy (plant production), zootechny (animal production), agrotechny (agricultural technology, especially dairying), agricultural engineering and rural economics. Thus far comparatively little attention has been given to the two latter branches of agricultural instruction in our colleges. There is, however, increasing interest in these subjects, and therefore good reason to believe that with the increase of resources of these institutions, more adequate courses along these lines will be provided. Notable recent advances along the line of agricultural engineering have been the establishment of a department of irrigation at the University of California, and the offering of special courses for irrigation canal superintendents and State water commissioners at the State Agricultural College of Colorado.

A new step of progress in agricultural education in this country is indicated in the plans for a Graduate School of Agriculture to be held in the summer of 1902 under the auspices of the Ohio State University and in cooperation with the United States Department of Agriculture and the Association of American Agricultural Colleges and Experiment Stations. The purpose of this school is to give advanced

instruction in the science of agriculture, and particularly in the methods of investigating agricultural problems and teaching agricultural subjects.

There has been a considerable increase in the total number of students attending agricultural courses in the colleges, but the great majority of these students are still unwilling or unable to complete the four years' course leading to the bachelor's degree. There is an increasing demand for short and special courses, and the colleges are meeting this to a greater extent than heretofore. A much larger amount of college extension work in agriculture is now being done than ever before. This includes, besides the wide dissemination of information through the experiment station publications, such things as nature-study lectures and leaflets, press bulletins, correspondence courses, farmers' institute lectures, exhibits at State and County fairs, and excursions of farmers to the colleges.

In providing for maintenance and new buildings at the agricultural colleges, the various State legislatures meeting during 1901 were more than usually liberal, so that in the aggregate these institutions now have materially increased resources. The State support of these institutions is changing from a temporary to a permanent basis. Colleges and universities receiving the benefits of the Acts of Congress of July 1, 1862, and August 30, 1890, are now in operation in all the States and Territories except Alaska, Hawaii, and Porto Rico. The total number of institutions in the United States maintaining courses in agriculture is 62; the aggregate value of the permanent funds and equipment of the land-grant institutions in 1901 is estimated to be \$67,060,000, of which \$1,928,000 was added in 1901, and their income was \$7,401,000. Out of a total attendance of 42,104 students, 6,860 were taking courses in agriculture.

The movement for the establishment of secondary agricultural schools and the introduction of nature study and elementary agriculture into the rural schools has increased in importance. Alabama continues to support nine Congressional district agricultural high schools, which annually accommodate about 2,000 pupils at a cost to the State of \$22,500. Minnesota has for a number of years supported a successful secondary school of agriculture in connection with the State university, and the legislature of 1901 appropriated \$2,000 a year for two years for the introduction of agriculture into the rural schools. The University of Nebraska has recently inaugurated a similar school of agriculture with a three-year course. A recent law in Wisconsin provides for the establishment of county agricultural high schools. In Missouri increased attention is being given to carrying out the provisions of the law requiring agricultural instruction in rural schools, and to prepare teachers for this work departments of agriculture have been established in three normal schools of that State. Through the efforts of the committee for the promotion of agriculture of New York a school of practical agriculture and horticulture has been put into successful operation at Briar Cliff manor, N. Y.

In many States the problem of improving the rural schools is causing general discussion, and there seems to be a marked tendency toward concentration; that is, the elimination of small schools and the establishment of centralized schools, often with free transportation for pupils living at a distance from the schoolhouse. This movement has in several cases resulted in the establishment of rural high schools, with the township or the county as a unit. Reports coming from sections where centralization has been tried show for these schools better supervision, better teaching, better buildings and other facilities for instruction, better health and morals on the part of the pupils, more regular attendance, a longer continuance of the large boys and girls in school, and considerably enriched courses of study. It is believed that this movement for the consolidation of rural schools will be an important factor in securing the general introduction of nature study with special reference to agriculture in the country schools.

The farmers' institute movement is growing in importance, attendance at the meetings is increasing, and State appropriations for this work are becoming more liberal. The institutes are now held in 43 States and Territories. In 19 of these they are under officials of agricultural colleges or experiment stations; in 17 they are under State or county officials; and in 7 they are under the joint control of State officials and the college or station officials. Successfully conducted institutes are found under each system of management. Some 2,000 institutes are now annually held in the United States, with an aggregate attendance of at least half a million farmers.

AGRICULTURAL EXPERIMENT STATIONS.

These are now in operation under the Act of Congress of March 2, 1887, in all the States and Territories and in Alaska, Hawaii, and Porto Rico. In Connecticut, New Jersey, New York, Hawaii, Missouri, Alabama, and Louisiana, separate stations are maintained wholly or in part by State funds. A number of substations are also maintained in different States. Excluding the substations, the total number

of stations in the United States is 60. Of these, 54 receive appropriations provided for by Act of Congress. The total income of the stations during 1901 was \$1,231,881. The stations employ 719 persons in the work of administration and inquiry.

The activity and success of the stations in bringing the results of their work before the public continued unabated. During the year they published 445 annual reports and bulletins. These were supplied to over half a million addresses on the regular mailing lists. A larger number of stations than formerly supplemented their regular publications with more or less frequent issues of press bulletins, and most of the stations report a large and constantly increasing correspondence with farmers on a wide variety of topics.

In Alaska stations have been continued at Sitka and Kenai, and a new station has been established at Rampart in the Yukon Valley. A preliminary agricultural survey of the Copper River region indicates that agricultural operations may be successfully conducted over a wide area there. It was shown that considerable quantities of hardy vegetables, such as potatoes, cabbage, cauliflower, turnips, lettuce, and radishes are already being grown in the interior, and there are large areas which may be used for this purpose and also for the production of grasses and forage plants. At the station at Rampart, rye and barley were matured. At Sitka the experiments with cereals, forage crops, and vegetables were continued and a considerable number of varieties were successfully grown. Good silage was also made of native grasses and stored in a log silo. At Kenai the experiments with cereals and vegetables were continued with considerable success. Seeds were distributed to 400 persons living in different parts of Alaska, and a considerable number of reports were received of those grown during the season of 1900. It is evident that the efforts of the government to aid in the development of agriculture in Alaska are greatly appreciated by residents of that Territory, and that they have already received substantial benefits from the work of the Alaska experiment stations.

In Hawaii a station was established by the national government in 1901 at Honolulu. Land has been cleared, buildings erected, and experiments begun. The station's work will include investigations in horticulture, coffee and taro culture, stock raising, poultry, diseases of plants and animals, and irrigation. The station for the sugar industry, supported by the Hawaiian Sugar Planters' Association, has been continued on an independent basis.

In Porto Rico a station has been begun but not yet permanently located, and experiments in coffee culture have been undertaken at Rio Piedras. Studies of injurious insects and plant diseases have been begun, and a soil survey of a portion of the island is in progress. Improved varieties of seeds and plants are being distributed.

The stations in Alaska, Hawaii, and Porto Rico are directly managed by the United States Department of Agriculture through the Office of Experiment Stations, which also continues to act as a central agency for all the stations in the United States. In 1901 this office issued Vol. XII. of the *Experiment Station Record* and numerous other publications largely based on the work of the stations. A collective station exhibit was made at the Pan-American Exposition. The stations in general were unusually prosperous in 1901. Their work was increased in extent and efficiency, especially by a closer affiliation with the Department of Agriculture and by the material enlargement of the resources of the colleges with which they are connected. The appreciation of the results of station work which practical farmers show increases from year to year.

A Bureau of Agriculture has been created by the Philippine Commission to conduct investigations and disseminate information regarding the agricultural resources and development of the Philippine Islands. Prof. F. Lawson-Scribner, formerly agrostologist of the United States Department of Agriculture, has been appointed chief of this bureau.

During 1901 there was much governmental activity for the advancement of agriculture in other countries both in the Old World and the New. The Russian Department of Agriculture and Imperial Domains inaugurated a system of commissioners of agriculture who will correspond in a general way to our commissioners of agriculture or to our secretaries of State board of agriculture. Each commissioner's office will have connected with it a corps of agricultural specialists who will work among the landowners and peasants. The Russian Department of Agriculture and Imperial Domains is also displaying considerable activity in its soil and forestry investigations and in the establishment of stations for the investigation of special subjects, such as the growing of flax, cotton, olives, etc.

In England the Board of Agriculture has made larger grants than formerly to agricultural colleges and societies for conducting agricultural investigations, and a private experiment station has been established in Lancashire. In Australia the Victorian Department of Agriculture is undergoing reorganization.

The Austrian government has recently established several experiment stations, notably the station for plant culture at Brünn, the station for investigations in plant and animal production at Otterbach, and an agricultural physiological station, with divisions of chemistry, physiology, and bacteriology, at Prague. In Hungary an experiment station for the analysis and study of wines was established in 1901 at Fiume.

France has established at Nogent-sur-Marne a Colonial Garden to have administrative control over French colonial stations and botanic gardens in different parts of the world and to furnish these institutions with seeds and plants. During the year oenological stations were established at Toulouse and Beaune and an agricultural station at Besançon.

In Germany two new stations have been established—a flax culture station at Sorau and a viticultural experiment station at Weinsberg. The West Indian Department of Agriculture, Barbados, has established three new stations at Montserrat and one at Tortola. Brazil has recently established a botanical garden and experimental demonstration field at San Vicente, and the Argentine Republic has decided to establish four experiment stations on the same general plan as those in the United States. A department of agriculture, with a small staff of experts, has been organized at Bangalore by the government of Mysore, India; also a dairy station at Gembloux, Belgium; a veterinary pathological institute and animal vaccine institute at Christiania, Norway; and an irrigation experiment station at Calgary, Canada. See DAIRYING, HORTICULTURE, and IRRIGATION.

AGUINALDO, EMILIO, the leader of the Filipino insurrection against the United States, was captured March 23, 1901, by Brig.-Gen. Frederick Funston (*q.v.*), at Palanan, in the island of Luzon, while in command of a temporary headquarters there. On April 2, he took the oath of allegiance at Manila and issued a proclamation to the Filipinos, in which he advised them to lay down their arms and acknowledge the sovereignty of the United States. He was assigned to quarters in Manila, under careful surveillance, and continued to advise peace among his old followers, it being his opinion that the Filipinos who held out against the American troops were ignorant of the real strength of the United States and unfamiliar with what had already been done toward restoring order in the islands. Aguinaldo was born about 1870, of Spanish parentage, and as a child served in the household of a Jesuit priest, where the opportunity to obtain an education was afforded him. At fifteen he entered the College of St. John de Letran at Manila, where he studied medicine, and in 1888 went to Hong Kong for further study. In 1896 he became prominent as a leader of the Filipino insurrection against Spanish rule, was exiled to Hong Kong, it is said in the pay of Spain, and when the American forces first occupied Manila in 1898, he cooperated with them. But his demand for Filipino independence, the condition of further aid from him, was denied by the American authorities, whereupon he set up a rebel government, of which he was the head. From that time (June 23, 1898) until he was captured, Aguinaldo directed the rebel forces with considerable ability, maintaining his supremacy by the exercise of an unusual shrewdness. His motives have been questioned, but he has generally been regarded as a shrewd guerilla fighter and a man of intelligence and force. Although at first in close confinement at Manila, his consistent friendliness toward the Americans soon gained him considerable liberty.

AHERNE, JAMES. See **HERNE, JAMES A.**

AIR-SHIP. See **AERIAL NAVIGATION.**

ALABAMA, one of the Gulf States of the United States, has an area of 52,250 square miles. The capital is Montgomery. Alabama was organized as a territory March 3, 1817, and admitted as a State December 14, 1819. The population in 1900 was 1,828,697, while in June, 1901, as estimated by the government actuary, it was 1,862,000. The population of the three largest cities in 1900 were: Mobile, 38,469; Birmingham, 38,415; and Montgomery, 30,346.

Finances.—The receipts for the fiscal year ending September 30, 1900, were \$2,656,350.78 and the disbursements \$2,198,420.17, leaving a surplus for the year of \$597,399. For the fiscal year ending September 30, 1901, the receipts were estimated at \$2,547,500, and the disbursements at \$2,526,970. The bonded indebtedness on September 30, 1900, amounted to \$9,357,600, entailing an annual interest charge of \$448,680. The total value of property in the state as returned for taxation in 1900 was \$266,893,288. At the same time, the tax rate was 7 1-2 mills, of which 5 1-2 mills was for general purposes and two mills for school and pension purposes. For the banking interests of Alabama, see **BANKS BANKING.**

Steel and Allied Industries.—Although Alabama is primarily an agricultural State, the census tables show that there has been a large growth in manufacturing and mercantile industries during the last half century. The population has increased during these years from 771,623 to 1,828,697, or 137 per cent., while the average

number of industrial wage-earners has increased from 4,936 to 52,902, or 971.8 per cent., aggregating in 1900 2.9 per cent. of the total population. The total amount of capital, exclusive of capital stock, invested in 1900 in mercantile industries was \$70,370,081, and the gross value of products, excluding material to the amount of \$21,844,174 re-used in the process of manufacture, was \$82,793,804. The large increase in the manufactures of Alabama is in a great measure due to the development of extensive deposits of iron, coal, limestone, and dolomite, which are found in unusual proximity and quantity in the Birmingham district. Directly dependent upon these natural resources is the manufacture of iron and steel, whose products in 1900 were valued at \$17,392,483, or 21 per cent. of the total value of the products of the State. Related to the iron and steel industry is the manufacture of foundry and machine-shop products, whose output in 1900 was valued at \$5,482,441, an increase of 149.7 per cent. since 1890. This industry has been stimulated by the large production of pig iron, and has in turn reacted to increase that production. Other important correlated industries are the manufacture of cast iron pipe, stoves, car wheels, boilers, engines, wire nails, tubing, and cotton ties. Owing to the fact that six railroads centre in Birmingham, car-shop and construction work has largely developed, the production in 1900 being valued at \$4,172,192, an increase during the decade of 163.9 per cent. Connected with iron manufactures is the manufacture of coke, whose products in 1900 were valued at \$3,726,433, giving Alabama third rank in the Union in this industry. It is noteworthy that the great development of manufactures in the northern part of the State has taken place largely without the advantage of navigable water for the cheap shipment of products. For years efforts have been made to connect the Birmingham district with tidewater at Mobile Bay by means of the construction of a canal and locks on the Warrior River. Of the five locks projected three were completed in 1895, and a route for the canal has been surveyed by United States engineers. It is estimated that water communication with Mobile would reduce freight charges on iron by 90 per cent.

Other Industries.—The manufacture of lumber and timber ranks second in importance among the industries of the State, the product in 1900 being valued at \$8,507,971, an increase of 51.2 per cent. in the decade. Dependent upon this industry is the manufacture of turpentine and resin, whose products in 1900 were valued at \$2,033,705. Notwithstanding the increase in the timber industry a considerable portion of Alabama's forests have never yet been cut. The lower part of the maritime pine belt is considered equal in extent and quality to the timber lands in the corresponding parts of Florida and Mississippi, and is said to be unsurpassed by the most favored sections of Atlantic pine forests. The third considerable industry in the State, the manufacture of cotton goods, is dependent upon Alabama's cotton crop, which in 1899 amounted to 1,103,690 commercial bales, or 11.4 per cent. of the total production of the United States. Cotton goods manufacturing is a recent industry in the State and has increased in the great ratio of 172 per cent. within the decade; products in 1890 being valued at \$2,190,771 and in 1900 at \$5,962,365. Allied to this industry is the manufacture of cotton-seed oil and cake, the products valued in 1900 at \$2,985,890, an increase during the decade of 148 per cent. Other industries are flour and grist milling, with products valued in 1900 at \$3,310,757, and the manufacture of fertilizers, the products in 1900 valued at \$2,068,162.

Constitutional Convention.—In accordance with the results of the election held in August, 1900, at which time the question of calling a convention to amend the constitution was affirmatively voted upon, a constitutional convention met in Montgomery in May, 1901, to revise or rather to rewrite the constitution. The most important work of the convention and the purpose for which it was primarily called was to draw up a new franchise law. For when the State constitution was adopted in 1875, the negro's right to vote was specifically guaranteed, in accordance with direction of Congress. As a result, extensive intimidation and ballot stuffing were practised to maintain the supremacy of the whites. That the whites did remain supreme is shown by the message of Governor Johnston to the legislature on May 2, 1899, in which, opposing the proposed convention, he said: "There is not a negro in all the Commonwealth holding an office under the present constitution, nor a justice of the peace, nor a constable, nor a single member of the General Assembly, nor has there been for nearly a generation." But it was thought by the State leaders that an end should be put to ballot stuffing and fraud, and that the disenfranchisement of the negroes should be accomplished by legal methods. The Democratic State platform, upon which the convention was elected, promised the voters to secure the legal maintenance of white domination without disenfranchising any white man except for crime and without violating the constitution of the United States. Owing largely to the excellent educational work done at Tuskegee Institute, Ala., and to the tact and ability of its president, Booker T. Washington, there was less antagonistic race feeling in Alabama than in several other southern States, and for this reason the proceedings of the convention were regarded with special interest. Shortly after

the convention opened a memorial, understood to have been drafted by Booker T. Washington, was presented, recounting the homely virtues of the negroes, their fidelity to their masters' interests at the time of the civil war, the errors and efforts they had since made, and concluding that while they knew that the task before the convention was a "delicate, trying, and perplexing one," they asked for such laws as would discriminate justly between good and bad citizenship wherever found and would not "merely change the name and form of fraud." This memorial was ordered by the convention to be immediately printed, and in other ways manifestation was made of a desire to remove from the convention all racial animus. Nevertheless the convention considered that negro suffrage should be restricted, and as this could not be done directly without violating the constitution of the United States, it was done indirectly and "ingeniously." See paragraph on Suffrage and Elections.

Other important and necessary changes made in the constitution, as stated by a committee of the convention in an open letter issued previous to the election of November 11, 1901, are as follows: The constitution of 1901 appropriates of its own vigor about eight times as much as the old constitution for public schools. In fact, the new constitution appropriates each year for this purpose nearly one-half of all the taxes levied and collected in the State, and it further directs the legislature to increase this fund from time to time as the resources of the State may justify. And although the new constitution prohibits a child of either race from attending a school of the other race, that provision of the old constitution is strengthened which provides that the public school fund shall be used equally for the benefit of both races. Under the old constitution, the legislators were so immersed in private and special bills to the exclusion of general bills that they came to represent almost solely their respective localities and not the State as a whole. Bills were habitually passed giving every manner of undue advantage to counties or corporations, and these local bills became an intolerable abuse. Under the new constitution, this evil is believed to have been absolutely annihilated, local and special bills being prohibited, and in order to prevent too frequent changes of laws, the legislature is to meet but once in four years. The governor also is believed to be saved under the new constitution from improper motives by the lengthening of his term to four years, making him ineligible to succeed himself, and denying him during his term of office and for one year thereafter the right to election or appointment to the United States Senate or any office under the State. The financial stability of counties and cities is protected by the provision that no county shall become liable for an amount including existing indebtedness of more than $3\frac{1}{2}$ per cent. of its assessed property; that cities and towns with a population of less than 6,000 cannot incur an indebtedness exceeding 5 per cent. except for the purchase and construction of public utilities, for which an additional 3 per cent. may be incurred; that cities of over 6,000 cannot become indebted for more than 7 per cent. of their assessed property except for improvements noted above, and that cities and towns of over 6,000 are forbidden to grant any municipal public utility franchises for a longer period than thirty years. Private corporations can no longer be chartered by a special act. The legislature is required to provide for the payment of a franchise tax by corporations, and when this tax is levied on foreign corporations, it must be in proportion to the amount of capital stock employed by the corporation in the State. Railroads are forbidden to give free passes or sell tickets at a discount to members of the legislature or any officer exercising judicial functions under the laws of the State. Special authority is given the governor to refund the State debt, and it is declared in substance that any appropriations made by the legislature shall not hinder the State from using all money in the treasury, if necessary, to protect the public faith. With these provisions removing the uncertainties of the present constitution, it is believed that there is no doubt that the State debt may be refunded at a much lower rate of interest, saving many thousands per annum to the taxpayers, and many times the cost of the convention. Amendments to the constitution may be proposed by three-fifths of the members of each house instead of as at present by two-thirds.

Provisions of the Constitution—Rights and Guarantees.—From the new constitution are omitted several of the features of the bill of rights of the old constitution adopted under the military pressure of the reconstruction days. Among these omitted provisions is that declaring that no educational or property qualification for suffrage or office shall ever be enacted; also, one announcing that the people of Alabama accept as final the established fact that there can be no secession from the Union, and, finally, one declaring that all citizens of the United States and of Alabama shall possess equal civic and political rights. In the new constitution the clause of the old constitution prohibiting the legislature from granting irrevocable grants of privileges, is strengthened by adding that "every grant of a franchise, privilege, or immunity shall forever remain subject to revocation, alteration, or amendment." In order to do away with some of the difficulties that have been encountered in criminal trials in the State, especially those where negroes have been

defendants and public feeling against them has run high, the new constitution provides that the legislature may by a general law provide for a change of venue at the instance of the defendant, and that such trials may be determined without the presence of the defendant if he is imprisoned elsewhere, and that while no person may be twice put in jeopardy for the same offense, yet judges may discharge juries for cause and the prisoner shall not then be deemed to have been placed on trial.

Legislature.—The new constitution changes the time for State elections from August to November; both State senators and representatives are to be chosen for four years and the legislature, instead of meeting biennially as before, is to meet quadrennially. To insure so far as possible honesty and efficiency in the legislature, several novel and interesting stipulations are made in the constitution. The most important of these are as follows: No one except legislators and press representatives may be admitted to the floor of the House except by unanimous vote—thus excluding lobbyists; no bill may become law until it has been referred to a standing committee of each House, acted upon by such committees and returned by them, and the action of the committee noted upon the journal of each House; no revenue bills may be passed during the last five days of the session, or, as it might be more properly put, "railroaded through during the closing hours of the session;" with a few excepted cases, the legislature is prohibited from passing special or local laws; but the legislature is directed to enact laws for the reasonable restraint, prohibition, and regulation of corporations and trusts, so as to prevent the unreasonable scarcity of articles or the restraint of competition or unreasonable increase in the prices of commodities. In the interests of both races, the legislature is prohibited from ever passing any law to authorize or legalize any marriage between any white person and a negro or descendant of a negro.

Suffrage and Elections.—The most important provisions of the new constitution were those restricting the suffrage with the avowed purpose of eliminating the ignorant or venal negro vote. The old constitution, as stated by a committee of the convention in an open letter to the people before the election of November 11, 1901, had been drawn up in 1875 when the North was still convinced that an electorate controlled by negroes was both possible and justifiable. This old constitution provided in the matter of the suffrage that all residents, not insane, who had not been convicted of crime were entitled to vote if they were citizens of the United States. The new constitution intended to adjust the suffrage to the actual needs and conditions of the State, provided a double electoral qualification system so that, first, all white persons then in the State might be registered, and that, second, all other persons might register whose qualifications would make them desirable citizens. More exactly, the constitution provided that at any time until December 20, 1902, the following might register as life electors: all persons who had served in the armies of the United States or of the Confederate States, and all descendants of such persons; and all persons who were of good character and who understood the duties and obligations of citizenship under a republican form of government. Of this good character and the duties of citizenship, a board of three registrars appointed in each county were to be the judges, though appeals from their decisions might be taken to the State courts. Second, after January 1, 1903, all those not previously registered as life voters might vote who were qualified as follows: First, those who could read and write any article of the constitution, and who, unless physically disabled, had been engaged in some lawful occupation or calling for the greater part of the twelve months preceding the time they offered to register, or those who were either *bona-fide* owners of forty acres of land in the State or owners of real or personal property whose assessed value was \$300 or more. The clause prescribing that the voter must have been engaged in some lawful occupation was stated to have been specifically aimed against those negroes of the younger generation who were sufficiently educated not to be debarred by an educational qualification, but who were nevertheless too lazy to work, who were undesirable citizens generally, and apt to be politically corrupt.

Executive.—Novel features in the formulation of rules for the executive department of the government provided that the attorney-general, secretary of state, and state auditor should constitute a board of pardons to advise the governor as to all petitions for pardon, but that the governor might act either in accordance with or contrary to their recommendations, and that if a prisoner escaped from a sheriff through the latter's fault and suffered death or other bodily harm, the sheriff might be impeached and removed from office and should not be eligible for any other office during the time he had been elected to serve as sheriff.

Elections.—At the elections held in Alabama on November 11, 1901, for the ratification or rejection of the new constitution, the vote cast was 108,613 for adoption and 81,734 for rejection; thus giving a majority for adoption of 26,879. The total vote cast, 190,347, was much heavier than that in 1900, when the total vote cast for president was 155,240 and for governor, 162,319, indicating apparently that the negroes

who in other southern states had shown themselves strangely apathetic in the matter of the curtailment of their suffrage rights, had in Alabama voted up to their full strength. According to the 1900 census figures (see **NEGRO PROBLEM**, paragraph Census) a little more than 59.5 per cent. of the male negroes of voting age in Alabama are illiterate. Under the new constitution, this means that that per cent. of all the negroes in the state will be disenfranchised. But these negroes may vote in accordance with the provisions of the new constitution so soon as they can read and write the English language and prove themselves industrious citizens.

State Officers.—Governor, W. D. Jelks; secretary of state, R. P. McDavid; adjutant-general, W. W. Brandon; attorney-general, C. G. Brown; treasurer, J. Craig Smith; superintendent of education, J. W. Abercrombie; commissioner of agriculture, P. R. Poole; commissioner of insurance, N. R. McDavid—all Democrats.

Supreme Court.—Chief justice, Thomas N. McClellan; associate justices, Jonathan Haralson, John R. Tyson, Henry A. Sharpe, and James R. Dowdell—all Democrats.

Congressional Representatives (57th Congress): In the House—George W. Taylor, from Demopolis; A. A. Wiley, from Montgomery; Henry D. Clayton, from Eufaula; Sidney J. Bowie, from Talladega; Charles W. Thompson, from Tuskegee; John H. Bankhead, from Fayette; John L. Burnett, from Gadsden; William Richardson, from Huntsville; Oscar W. Underwood, from Birmingham—all Democrats. In the Senate—E. W. Pettus (until 1903), from Selma; and John T. Morgan (until 1907), also from Selma—both Democrats.

ALASKA. An unorganized territory of the United States purchased from Russia in 1867, and governed under a civil code passed by Congress in 1900. The area of Alaska, as shown by the most recent surveys, is approximately 590,884 square miles, or about one-sixth of the whole territory of the United States. The population, as shown by the census of 1900, is 63,592, of whom 25,536 are natives. The increase in population since 1890 has been 31,450, or 98.4 per cent. The average number of persons to each one hundred square miles is approximately eleven. There are four cities of more than 1,000 inhabitants, namely, Nome, 12,486; Skagway, 3,117; Juneau, 1,864; and Sitka, 1,396. The city of administration is Sitka. Alaska constitutes, by the act of 1900, a federal judicial district, with three divisions and three courts. Alaska has no delegate to Congress, nor has it a local legislature.

Mining.—The mining industry of Alaska was vigorously prosecuted during the season of 1901, the output in the region of Nome alone being estimated at \$7,000,000, although the development of the mines in this vicinity was greatly hampered by conflicting mining claims (see paragraph Judiciary Scandal). Placer mining still attracts the greatest attention, because the returns are immediate and can be conducted by individuals with very little capital. Mines at the head waters of the Koyukuk River also attracted much attention during the year, and some of the mining camps there were established as far north as latitude 67°. These are the most northerly diggings on the continent. At this rate, the governor remarks, the American miner will keep on till he reaches the pole. Other productive regions during the year have been on the Porcupine and Tanana Rivers and near the headquarters of the Kuskokwim. Quartz mining makes great advances each year, the quartz being very widely distributed, though as a general thing the ore body is of a low grade, averaging in many cases not more than \$2.00 per ton. Silver and platinum have been found in paying quantities, and discoveries of tin and cinnabar have been reported. There are rich veins of iron ore, but very little attention has been paid to iron, both on account of heavy transportation charges and because of the search for gold. Copper mines have been opened up on the shores of Prince William's Sound, Prince of Wales Island, and Dall Island. The governor expresses the opinion that the mining interests in Alaska have become so extensive and valuable as to render advisable the appointment of a commissioner of mines, whose duty would be to exercise general supervision over the mining operations of the district, to protect mining companies against unjust litigation for damages, and to require the companies to conform to regulations prescribed for the protection of miners.

Fisheries.—Next to mining, the fishing industry is probably the most important of Alaska, and it has the added advantage of permanence and safety for investment. The salmon catch for the year 1900 had a market value of over \$6,000,000, and for the season of 1901, it was estimated at about \$7,000,000. Large quantities of halibut and other fish were also taken, shipped to ports on Puget Sound, and thence taken to inland markets on refrigerator cars. The fish industry, however, may be greatly developed; along the shores of Alaska are cod banks hitherto untouched, aggregating in extent many thousands of square miles, and by the establishment and maintenance of salmon hatcheries by the federal government, a continuous and increasing supply of this fish would be assured each year.

Agriculture.—The agricultural possibilities of Alaska have been but recently recognized. Instead of being almost wholly, as has been popularly supposed, a bleak, ice-

covered land, valuable only for its gold fields, the surveyor-general of the territory reported in 1901 that he estimated, from data collected from authentic sources, that not less than one-fifth of Alaska was tillable and could be utilized for pasture and for raising a large diversity of agricultural crops. The climate of Alaska, especially in the southwest, is alleged to be better for agricultural purposes than the great plains of Wyoming, Montana, and some parts of Nevada. Even hundreds of miles north of Skagway the attempts at gardening and farming are said by the governor of the territory to have been surprisingly successful. Hay and grain are raised at Fort Selkirk; vegetables of many kinds at Dawson; while the great river valleys like those of the Yukon, Tanana, Kuskokwim, Sushitna, Knik, and Copper embrace cultivable areas large enough for good-sized States. The quantity of grass which every year goes to waste in Alaska is asserted to be of greater market value than the gold output. The great obstacle to the development of these interests has consisted, up to the present time, not so much in inaccessibility of the lands and the cost of transportation as in the fact that settlers are unable to acquire any title to the lands they occupy. See paragraph Public Lands.

Other Industrial Interests.—The timber of Alaska, all of which belongs to the government, is one of the most valuable resources of the territory. Although a number of sawmills are allowed to cut timber by payment to the government ten cents for each hundred cubic feet, the amount thus cut represents but a small fraction of the amount of wood used in the territory each year. Nearly every board that is taken to western Alaska from Yakutat to Port Barrow is shipped from Puget Sound or California, and a large part of the wood used in southeastern Alaska comes also from sound ports. The reason for this is that lumber can be manufactured more cheaply in the large mills in the States than in Alaska. There is an enormous annual waste of timber in the territory caused by the falling and decay of trees that have long since attained their full growth. It is recommended that the government enact laws allowing the cutting of the full-grown trees and protecting the young timber from destruction. In the opinion of the governor, the fur trade of Alaska is doomed to extinction. The sea otter and fur seal are fast disappearing for lack of proper protection by the United States; the beaver has been driven to remote districts; the Arctic fox, the bear, and mink seem to be the only fur-bearing animals that are still found in considerable numbers. The enacting of a stringent game law by Congress, in order to afford better protection to the moose, caribou, deer, and other large game, is advocated.

Communication.—Military telegraph lines are now in operation in Alaska between St. Michael and Mulato, Eagle, and Dawson; lines are being constructed between Eagle and Volges, and Mulato and Fort Gibbon, and cables have been laid between St. Michael and Nome, Juneau and Skagway. The cable along the shore from southeastern Alaska to Unalaska on the Aleutian Islands would be of great importance commercially, and on account of the commanding position of Unalaska, would be valuable from a strategic point of view. Attention is called to the necessity of communication by cable with the States and the Philippines. Cable communication between the States and the Philippines is recommended by way of Alaska, as this would be the shortest and, commercially, the most advantageous route.

Education.—Under the Congressional act of 1900, the main revenue of Alaska was directed to be raised by license fees exacted from the various classes of business concerns operating in the territory. Outside of incorporated towns, one-half of the amount of these licenses, minus the expenses for the maintenance of the courts, was to be used for educational purposes. During the fiscal year ending 1901, in addition to the towns of Skagway, Juneau, and Ketchikan, previously incorporated, the towns of Nome, Treadwell, Eagle, and Valdes were incorporated, and the schools in these towns were placed in accordance with the act of 1900 under the care of the local authorities. Whether the funds received from licenses outside of the incorporated towns were sufficient to support schools outside of the towns, it was not possible, as stated by the secretary of the interior, to ascertain by the end of the year 1901. In the opinion of the governor, however, the funds would not be sufficient, and the governor regretted that Congress had withdrawn the usual annual appropriation of \$30,000 previously made for the purposes of education in Alaska.

Public Lands.—Except for lands acquired by individuals for mining purposes, nearly all land in Alaska is at present a part of the public domain. In fact, as stated by the secretary of the interior in his annual report for 1901, it is practically impossible under existing conditions for persons to acquire land in Alaska except for mining purposes. For, although by a Congressional act of 1898, the homestead laws were extended to Alaska, in so far that they permitted persons to acquire not more than eighty acres of land each, yet title to these lands could not be acquired until they were surveyed, and no public lands have as yet been surveyed for this purpose. It is solely on this account, as is stated, that there is really no permanent population in Alaska, and that consequently not only could no adequate

taxes be raised for the maintenance of a territorial government, if one was formed, but nearly all industries in Alaska, except that of mining, have so far been neglected. Yet, as stated by competent persons, the natural resources of Alaska, especially as regards the possibilities of agricultural products (see paragraph Agriculture), are very great, and all that is needed to develop them is the enactment of proper laws by Congress. It was recommended, therefore, by the governor of the territory that Congress should immediately appropriate money for the survey of homestead lands so that title could be acquired thereto, and also that the amendments made to the homestead laws in 1898, when they were extended to apply to Alaska, be revoked. For these amendments prescribed that not more than eighty acres of land could be acquired by each person, and that moreover title could not be acquired to more than one-half of the shore lines of navigable streams. The governor considered that the right to title along streams should be freely given, and that owing to the great expense of transportation both to and from Alaska, title should also be allowed, as was always done in the case of other territories of the United States, to at least 160 acres of land.

Judiciary Scandal.—Under the Congressional act of 1900, dividing Alaska into three federal judicial districts, Arthur H. Noyes was appointed justice of the second district, with headquarters at St. Michael, near the Nome gold fields. At that time the shore line of Alaska for some fifty miles north from Cape Nome was staked off by placer miners, who had recently discovered gold in large quantities. Owing to the lack of definite laws governing the filing and right to possession of these claims, nearly the whole area comprehended in the long strip of beach was under litigation. These litigations were awaiting settlement at the time Justice Noyes assumed jurisdiction. From the time of his arrival, scandals arose concerning his use of the judicial power. It was asserted that he had not only shown incompetence and negligence in the exercise of his office, but that he had shown marked favors to a few of the larger gold companies in the appointment of receivers to the disadvantage of the smaller claim holders. On August 27, 1901, a petition was signed by fifty-two members of the Nome bar, praying for the removal of Justice Noyes, claiming that he had lost the confidence and respect of the bar, of the court, and of the residents of his judicial district; that his orders and decrees were violated and treated with open contempt, and that the introduction of a fearless and honest judge was urgently required at Nome to prevent further riot and bloodshed over disputed claims, to relieve the congested court calendar, and to protect life, liberty, and property. At about the same time, the matter was brought to the attention of the Circuit Court of Appeals for the Ninth Circuit in California, which court vacated certain orders that Justice Noyes had made late in the fall of 1900 and later found him guilty of contempt of court for not complying with its mandates, and imposed a fine upon him of \$1,000. Pressure was then brought upon the attorney-general of the United States to order Justice Noyes's removal, both on the findings of the court in California and on account of the charges brought by the bar and private residents of Nome. The whole episode was declared by Hon. John G. Brady, governor of Alaska, to have been the most unfortunate in the history of the territory. For not only had the adjudication of the most pressing conflicting mining claims been postponed, but feelings of doubt and uncertainty had been created in the minds of the people inimical to the entrance of capital into Alaska and to the development of both private and corporate mining claims.

Needs of the Territory.—In his annual report for 1901, the governor stated that he did not recommend the authorization by Congress of a territorial form of government for Alaska. For owing largely to the inability of residents to acquire title to land in the territory, there was not a sufficiently large or stable population to raise the revenue necessary for this form of government. The governor did recommend, nevertheless, that Alaska be allowed a delegate in Congress to represent its interests, and he especially recommended that Congress should make appropriations for the immediate survey of lands so that title could be acquired to them under the modified homestead acts extended to Alaska in 1898. Other recommendations were for the passing of a bill that would allow the natives to acquire citizenship; for the establishment of cable communication between Alaska and the United States; for the establishment and maintenance of a hospital in southeastern Alaska, and for the building of a penitentiary.

See MEASLES, PUBLIC HEALTH, SMALLPOX.

ALBA, Duke of, Don CARLOS MARIA ISABELLA STUART, Spanish nobleman, died in New York City, October 15, 1901. He was born in Madrid, Spain, December 4, 1849, and inherited from his father numerous titles and estates. He possessed four dukedoms, eleven marquisates, and fourteen titles of count, was a Spanish senator and chamberlain, and was a peer of France. While a guest of Sir Thomas Lipton during the last international yacht races at New York, he became ill and died after a few days.

ALBANIA. See **TURKEY.**

ALCOHOL. The discussion of the food value of alcohol was continued during 1901. The dictum of Professor Atwater, of Wesleyan University, that alcohol is a food in the sense that it supplies energy to the body, while not forming tissue, has been accepted by some as an old physiological fact. Several investigators, however, have combated this statement, as also the former teaching that alcohol is an excellent remedy in acute infectious diseases. Doyen, Abbot, Verlaguss, Ranelletti, and Goldberg seem to agree that alcohol is a cell poison, although possessing a high caloric value. T. Alexander Mac Nicholl, of New York, in the investigation of heredity as a factor in mental deficiency, traced the family history of 463 children in 150 different families through 3 generations. Of these children, 313 had drinking fathers, 51 had drinking mothers, 205 had drinking grandparents, and 246 had drinking parents and grandparents. Of the children of drinking and neurotic ancestry, 87 per cent. were mentally deficient, and 76 per cent. suffered from some neurosis or organic disease. Of 231 children with total abstinence antecedents, less than 3 per cent. were dull, and but 18 per cent. neurotic. Of 24 families of drunken parents, including 113 children, 93 had organic diseases, 66 were mentally deficient, 7 were idiots, 8 were dwarfs, 7 were epileptics, and 16 were drunkards. Of the 236 children of moderate drinkers, 186 had organic diseases, 169 were mentally deficient, 8 were idiots, 8 were insane, and 21 were drunkards. Of 116 children in 31 families with neither neurotic nor drunken ancestry, 20 had organic disease, 3 were mentally deficient, and 1 was a drunkard. Thus the children of drinking parents show less than 12 per cent. of normal conditions of mind and body, while the children of total abstainers show about 82 per cent. Mac Nicholl concludes: "Alcohol is a most active agent in the production of hereditary degenerations. The families of drink imbibers in large measure augment the number of drunken, diseased, and defective members of society." Of 300 suicides, upon whose bodies Professor Meller, of Kiel, made autopsies during the past five years, 143 had organs diseased by alcoholism. Hirschl, of Vienna, reports that 30 per cent. of the men admitted to the insane department of the Vienna General Hospital gave a history of chronic alcoholism. Of these alcoholic patients, 43 per cent. died from delirium tremens, and 28 per cent. were committed to insane asylums for life.

ALDRICH, LOUIS, American actor, died at Kennebunkport, Me., June 17, 1901. He was born in Ohio, in 1843, and early in life went on the stage. After a season of starring in California and Australia, he joined the Boston Theatre stock company, where, in 1866, he played Nathan to the famous Leah of Miss Bateman. Later he was leading man at Mrs. John Drew's Arch Street Theatre, Philadelphia, and at Wood's Museum, New York City, where he played second parts to E. L. Davenport. Aldrich's best-known work was in *The Danites* and *My Partner*. In 1870 he appeared in *The Kaffir Diamond* and *The Editor*, with doubtful success. He was for many years actively connected with the Actors' Fund of America, serving as its vice-president and president. His power as an actor was greatest in melodrama, though successful also in certain lighter rôles requiring rough humor and pathos.

ALEXANDRA, Queen of England, acceded to the title of Queen upon the death of Queen Victoria (*q.v.*), January 22, 1901, when her husband, Edward VII. (*q.v.*), ascended the throne. She was born December 1, 1844, and is the eldest daughter of King Christian IX. of Denmark, and the sister of the Empress of Russia and of the King of Greece. She married Albert Edward, Prince of Wales, March 10, 1863, and four of the six children born to them survive, the eldest, now Prince of Wales, being the heir-apparent to the throne.

ALEXIS, PAUL, French novelist, died in Paris, July 30, 1901. He was born at Aix, France, June 16, 1847, and was educated at the college there. Going to Paris at an early age, he became a friend and literary follower of Zola, and allied himself with the so-called naturalistic school of fiction writers. The increasing prominence of Zola's work lifted Alexis out of comparative obscurity and gave his writings considerable popularity. One of his works was an extended and apologetic study of his master; and a later series of laudatory articles concerning Zola involved him in a duel with Albert Delpit.

ALFRED THE GREAT MILLENNIAL. The thousandth anniversary of the death of Alfred the Great was celebrated in Winchester, England, with a series of commemorative exercises September 18-21, 1901. These exercises began with visits to Westgate, Castle Hall, Hyde Abbey (where Alfred was buried), Wolvesey, St. Cross, and other places connected with the history of the Saxon king, and included readings from *Becket*, by Sir Henry Irving, and lectures on King Alfred the Great, by Frederic Harrison, and the Coinage of Alfred the Great, by Sir John Evans. The culminating event occurred on September 20, when a colossal bronze statue by Hamo Thornycroft was unveiled, and an eloquent address delivered by the Earl of

Rosebery, in which he described the remarkable qualities of manhood and leadership exhibited by the great Saxon king, in the course of which, having in mind the recent death of President McKinley, he said: "King Alfred wrought immortal work for us and for our sister nation over the sea, which in the supreme moments of stress and sorrow is irresistibly joined to us across the centuries and across the seas." A procession, participated in by academic, civic, and ecclesiastical representatives escorted by military and naval forces, preceded the unveiling of the statue. The ceremonies were under the charge of a large committee of representative men of Great Britain and the United States, over which the Lord Mayor of London acted as chairman, while Alfred Bowker, mayor of Winchester, was secretary. King Edward was the patron. The English Lords of the Admiralty launched a first-class cruiser of 14,000 tons in October, to which they gave the name of King Alfred, in commemoration of the celebrations.

A month later the memory of Alfred was celebrated in New York City by a series of exercises that began with a special memorial service in St. Paul's Chapel, on October 27, when the sermon was preached by the Rev. Henry Lubeck, in which he compared King Alfred and George Washington, saying that they were alike in many points of character, that it was fitting the memory of the great King should be celebrated in a church where the first President of the United States had been wont to worship. If, said the preacher, King Alfred's memorial celebrations should be an additional cause for harmony between the English and the American people, then there was one more benefit to the human race that could be laid to the credit of the King. On October 28, the accepted date of the death of Alfred, a banquet was held at Delmonico's, at which Mr. Alfred Bowker, the mayor of Winchester, was the guest of honor. Toasts were drunk to the President of the United States, King Edward VII., scion and heir of Alfred; Alfred the King, responded to by Mr. Bowker; Alfred the Statesman and Lawgiver, by Mr. Stewart L. Woodford; Alfred as a Constitutional Monarch, by Mr. John G. Bourinot; Alfred in Relation to Literature and Religion, by Mr. Hamilton W. Mabie; Alfred the Author, by Mr. Francis A. March; and Alfred the Soldier and Sailor, by Mr. Wager Swayne. A collection of books, manuscripts, and engravings, relating to King Alfred and his times, were placed on exhibition in the Lenox Library, New York, beginning with October 28, and continued during the months of October and November. As a permanent memorial the trustees of the New York Public Library, Astor-Lenox-Tilden foundation, have been requested to set apart an alcove or annex, to be known as the Alfred Memorial Library, to be devoted to literature relating to the Anglo-Saxon period, and to include records of all the celebrations throughout the United States. If sufficient money is obtained, it is desired to establish in connection with the library a series of annual lectures on the Anglo-Saxon period by a distinguished scholar, either from Great Britain or the United States.

The interest aroused in these various commemorative exercises naturally led to much study of the period of Alfred, and it has been well said that "later historians have but repeated the conclusions of their predecessors, nor has searching modern scholarship removed from Alfred's brow a single leaf of the five-fold laurel, of king, soldier, poet, law-giver, and saint, that has for a thousand years encircled it." A book of interest in connection with the Millennial is *Alfred the Great*; containing chapters on his life and times, by Frederic Harrison, Charles Oman, Professor Earle, the Bishop of Bristol, Sir Clements Markham, Sir Frederick Pollock, and Rev. W. J. Loftie; also containing an introduction by Sir Walter Besant, and a poem by the Poet Laureate, edited, with preface by Alfred Bowker (London, 1889); also *The Story of King Alfred*, by Walter Besant (New York, 1901).

ALGERIA, a country of northern Africa, is usually regarded as a colony, but technically is a province of France. The capital is Algiers.

Area and Population.—The total area of the three departments, Oran, Algiers, and Constantine, comprising Algeria, is stated at 184,474 square miles. The southern boundary is not well defined, and some 123,500 square miles of the Sahara, with a population of 50,000, are claimed by France as belonging to the province. The total population in 1896, exclusive of the French army, was 4,429,421. The population according to the census of March, 1901, was 4,774,042, divided by departments as follows: Constantine, 2,039,458; Algiers, 1,631,476; Oran, 1,103,108. The French colonists numbered about 292,000. Most of the inhabitants are Mohammedans.

Government and Finance.—The province is administered by a governor-general (M. Paul Revoil), who is largely directed by the French ministers in Paris. The legislative power is vested in the French chambers, in which each of the three departments is represented by one senator and two deputies. On June 3, 1901, a French law went into operation authorizing Algeria to discuss and vote its own budget, which had hitherto been done by the French chambers. The extreme south of the country is under military rule.

The largest items of revenue are direct taxes and customs, and the largest expenditures are for public works, instruction and worship, and finance. The estimated revenue and expenditure for 1901 were 55,314,144 francs and 55,237,675 francs respectively (the franc is worth 19.3 cents). The figure for expenditure is exclusive of the estimates for war, marine, and service of the debt, which, if added, would show a considerable deficit. Such deficits, which are usual, are met by France.

Industries and Commerce.—Agriculture is the chief occupation of the inhabitants. The production in quintals (220.46 pounds) in 1899, was reported as follows: Barley, 7,203,065; rye, 5,021,165; wheat, 1,042,908; oats, 658,067. In that year there were produced 4,502,028 hectolitres of wine; in 1900, 5,444,180 hectolitres. Cork and esparto are important products. Algeria is rich in mineral deposits, but development has been retarded by lack of transportation facilities. From 1896 to 1900 Algeria exported 3,845,566 tons of mineral ores; of these 2,553,600 were iron, 1,136,200 phosphates, 135,800 zinc, 16,400 lead, and 3,500 copper. The outputs in tons for 1899 and 1900 were respectively: Iron, 633,300 and 604,000; phosphates, 281,000 and 273,500; zinc, 36,900 and 30,200; lead, 6,200 and 2,100; copper, 1,600 and 24. The foregoing figures show a total decline of about 50,000 tons, but the outlook for 1901 was more favorable. It was expected that work would be resumed in the Guerromna mines, abandoned since 1893, and other enterprises were projected. In the special trade the imports and exports in 1898 amounted to 290,059,706 francs and 265,543,209 francs respectively, the imports from and the exports to France being 225,535,389 francs and 224,451,296 francs respectively. Similar figures for 1899 are 309,947,382 and 325,407,699 for the total, and 260,421,593 and 271,467,620 for the French trade.

Communications.—One of the most important methods taken by the French government in its successful development of Algeria is the construction of roads, railways, harbors, etc. In 1898 the national roads had a total length of 1,815 miles. The railways in the same year aggregated 1,821 miles, and in 1900 2,156 miles; these figures include 325 miles in Tunis (*q.v.*). The railway extending from the coast to Ain-Sefra, in Southern Oran, is being continued still further south; the section from Ain-Sefra to Zobia (125 kilometres) was opened in October, 1901. In 1898 there were 7,260 miles of telegraph line. A telegraph cable between Oran and Tangier (Morocco) was opened on June 24, 1901.

History.—During 1901, violent anti-Semitic feeling in Algeria resulted in riots and other disturbances; there was a number of native outbreaks more or less important. In April, the Arab tribe known as the Beni Ben Asser sacked the village of Marguerite, 50 miles from Algiers, killing many of the inhabitants. The rebels were driven to the mountains by the troops. The outbreak led the governor-general, M. Jonnart, to address to the Algerian prefects a circular in which he reiterated the need of applying various administrative reforms which he proposed in September, 1900. He insisted that it was the duty of the administrators of the mixed communes to lay aside "red tape" and to "participate actively in the progress of ideas and the general life and progress of the community by taking the initiative in proposals intended to favor not only the development of colonization, but the condition of the natives and their material and moral situation." In a debate in the French chamber on the Algerian uprising, Algerian deputies accused British missionaries of carrying on an anti-French propaganda and distributing rifles among the natives. The latter accusation was subsequently declared by the premier, M. Waldeck-Rousseau, to be entirely false. On May 17, 1901, M. Jonnart resigned the governor-generalship on the ground of ill health. He was succeeded, June 18, by M. Paul Revoil. M. Revoil, who is a brother of the late Georges Revoil, the explorer of Somaliland, has occupied a number of government positions, including the posts of minister to Brazil, sub-resident at Tunis, and minister to Morocco. See FRANCE (paragraph Colonial Policy).

ALIEN INSANE. See INSANITY.

ALLAN, ANDREW, Canadian shipbuilder and owner, died in Montreal, Quebec, June 27, 1901. He was born at Saltcoats, Scotland, December 1, 1822, and went to Canada in 1839. In 1846 he joined his brother in Montreal and the firm established a line of fast-sailing packets between Canada and Great Britain, to which in 1853 were added steamships. In 1882 Allan became head of the company, which is now known as the Allan Line. For some years he was chairman of the Board of Harbor Commissioners of Montreal.

ALLAN, GEORGE WILLIAM, Canadian statesman, died at Toronto, Canada, July 24, 1901. He was born at York (now Toronto) January 9, 1822, was educated at the Upper Canada College, and began to practice law in 1846. After an extended tour of the world, Mr. Allan entered municipal politics, and in 1885 was elected mayor of Toronto. In 1858 he was sent to the Legislative Council of Upper Canada as a representative of Toronto, a seat which he held until the confederation in

1867. By royal proclamation he was called to the newly organized Canadian Senate in the same year, and remained a member until his death. He served as speaker of the Senate (1888-91), and was appointed (1891) a member of the Canadian Privy Council. From 1877 he served as chancellor of the University of Trinity College at Toronto. He was a man of generous public spirit.

ALUMINUM. The production of aluminum in 1900, as reported by the U. S. Geological Survey, was about 6,000,000 pounds, as compared with 5,200,000 pounds in 1899. All of this was manufactured by the Pittsburg Reduction Company, which contemplates the erection of works at Shawanigan Falls, Quebec. The total value of the imports for 1900 was \$50,444, and included the crude material, bars, rods, sheet and manufactured aluminum. There is a tendency to use aluminum instead of copper in the manufacture of electrical conductors, on account of its cheapness, and several transmission lines of this material have been erected. Aluminum conductors have not been in use long enough to establish the durability of the metal. Aluminum, when used for electrical work, must be very pure, for the presence of impurities has a marked effect on the conductivity, the action of iron being especially noticeable. With regard to the resistance of the wire to corrosion, sodium seems to exert the most injurious effect, after which comes silicon. J. B. C. Kershaw found that aluminum became badly corroded in towns where there was much sulphurous acid gas in the atmosphere. J. H. Pratt has published a paper on the *Sources and Uses of Aluminum* (*American Manufacturer*, Oct. 31, 1901).

AMBIDEXTERITY. See **PSYCHOLOGY, EXPERIMENTAL.**

AMENT, WILLIAM SCOTT, an American missionary in China, one of the eight hundred white Christians besieged in Peking during the summer of 1900. His action in appropriating a deserted Chinese residence for the housing of the native Christians under his charge and disposing of certain articles found in the house, was widely discussed in the press. He was born at Owosso, Mich., September 14, 1851; educated at Oberlin College and Andover Theological Seminary, and in 1877 went to China as a missionary under appointment of the Foreign Missions Board. After serving three years at Pao-Ting, he was transferred to Peking. Dr. Ament was in charge of native Christians, to the number of 3,000, and of 800 white residents when Peking was relieved by the allied forces in June, 1900. As an expedient to provide shelter for those under his charge, he seized the house of a Boxer leader, and, to provide food, sold clothing and bric-à-brac found in the house to the amount of \$2,500. Through an agreement with the Chinese government, this sum was deducted from an indemnity fund of \$30,000 demanded for the families of murdered Chinese Christians and for loss of property due to the Boxer uprising.

AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE. See **POLITICAL AND SOCIAL SCIENCE, AMERICAN ACADEMY OF.**

AMERICAN BOARD OF COMMISSIONERS FOR FOREIGN MISSIONS, founded in 1810, thereby claiming the distinction of being the oldest foreign missionary society in the United States, has in the past 90 years of service sent out 2,324 missionaries and organized some 500 churches, into which have been received nearly 155,000 members, a work requiring the expenditure of about \$32,000,000. The board in 1901 maintained in 20 missions with 97 stations, and numerous outstations and places for stated preaching, 544 missionaries and 3,483 native workers; there are 505 churches and 929 Sunday-schools, including respectively 50,892 members and 66,601 scholars, statistics which indicate a year of growth. The medical and educational departments are noteworthy features of the work; some 40 persons are engaged in the former branch, while the latter maintains 1,238 schools, not including 13 colleges with 2,132 students and 17 theological seminaries with 228 students, which have a total attendance of 62,188 pupils. Contributions from home sources in 1901 aggregated \$697,370, to which was added \$147,879 by native Christians, a total of \$845,249. The ninety-second annual meeting of the board, October 8-11, 1901, in Hartford, Conn., witnessed the liquidation of the entire debt of \$102,000, an excess over that amount being subscribed. The resumption of missionary work, as far as possible, in the disorganized Chinese fields was reported, and interesting figures, based on the amount of home and native contributions in proportion to wage rate prevailing in lands of these two sources, were offered to show that the natives are not mere beneficiaries. It is worthy of note that, of the total amount of contributions, but 6½ per cent. on the average is expended on administration, the remainder being applied directly to missionary work. The convention of 1902 will meet in October, at Oberlin, Ohio. Rev. William Scott Ament of the American Board was the central figure in a controversy in 1901 over missionary methods in China; the discussion, provoked by an article by Mark Twain in the *North American Review*, assumed broad proportions in the press. The charge of robbery was met by Mr. Ament's explana-

tion that the collected indemnities went to reimburse native Christians (see **AMENT, WILLIAM SCOTT**). The abduction by brigands of Miss Ellen M. Stone, a missionary of the board to Bulgaria, has given rise to general interest and has initiated a widespread discussion on the ethics of ransom. See **TURKEY** (paragraphs on History).

The administrative office of the organization is at 14 Beacon Street, Boston. President, Samuel B. Capen, LL.D.; district secretaries, Rev. Charles C. Creagan, D.D., 105 East Twenty-second street, New York City, and Rev. A. N. Hitchcock, D.D., 153 La Salle Street, Chicago.

AMERICAN ECONOMIC ASSOCIATION. See **ECONOMIC ASSOCIATION, AMERICAN.**

AMERICAN LIBRARY ASSOCIATION. See **LIBRARY ASSOCIATION, AMERICAN.**

AMERICAN MISSIONARY ASSOCIATION. See **MISSIONARY ASSOCIATION, AMERICAN.**

AMERICAN FEDERATION OF LABOR. See **FEDERATION OF LABOR, AMERICAN.**

AMHERST COLLEGE, Amherst, Mass., founded in 1821, had in 1900-01 a faculty of 36 and a student body of 404. President, George Harris, D.D. During 1901 an addition of \$210,000 was made to the endowment. Plans were adopted for the erection of an astronomical observatory during the coming year. During the year there were slight changes made in the curriculum, in the form of additional courses in Greek and Italian art, and in navigation. The college also adopted the plan of making all courses elective after the freshman year. The income for the year from all sources was \$104,000.

ANÆSTHESIA. The custom of giving nitrous oxide, or "laughing gas," as a preliminary to ether, is becoming common in large cities, where operations are frequent and professional anæsthetists are to be found. The advantages of this method of producing general anæsthesia are its agreeableness, especially to the nervous or to children, its avoidance of the irritation and choking sensations during the first stage of anæsthesia, and the rapid action of the gas. The injection of cocaine into the spinal canal, termed subarachnoid, or rhachidian, or medullary anæsthesia, is supplanting general anæsthesia in many cases. This process causes loss of sensation of feeling and of pain over a large area of the body, without the abolishment of consciousness. This method was suggested by Dr. J. Leonard Corning, of New York, who demonstrated its possibility in 1885. Professor Bier, of Kiel, revived the procedure in 1899, and Professor Tuffier, of Paris, adopted it enthusiastically in the same year. In securing this medullary anæsthesia the solution of cocaine is thrown into the fluid in the spinal cord canal by means of a long hypodermic needle, inserted generally between the second and third lumbar vertebrae. While by this method there is no effect on the heart, respiratory tract, or kidneys, no danger from pneumonia in the aged or feeble, less nausea and vomiting, all of which occur as concomitants of ether anæsthesia, yet severe headache, vertigo, cyanosis, rise of temperature, weakness and loss of sphincter control may ensue, and most of these unpleasant conditions may last for a week. Mintz, of Moscow, suggests injecting a solution of sodium bromide with that of cocaine, a method by which he secured alleviation of the unpleasant symptoms following the analgesia. European obstetricians have had better results in the use of medullary anæsthesia with women in labor than American physicians. The ninth and final report of the committee on anæsthesia, appointed ten years ago by the British Medical Association, was published in 1901. Of 25,920 cases of anæsthesia in hospital and private practice, 13,393 were cases of chloroform anæsthesia; 4,595 of ether; 2,911 of nitrous oxide; 2,071 of nitrous oxide and ether; 678 of "A. C. E. mixture" (alcohol, chloroform, and ether); and the rest various combinations. The analysis of their figures shows that chloroform anæsthesia was responsible for 78 cases of danger (including death), or 0.582 per cent. of the cases, while ether was responsible for but 3 danger cases, or 0.065 per cent.

ANAM or ANNAM, a French dependency on the China Sea, extending from Tonquin on the north to Cambodia and Cochin-China on the south, forms a division of the French colony of Indo-China. The estimated area is 88,780 square miles and the estimated population 6,000,000. The capital is Hué, population about 30,000. Anam is a protected native state which has been under French control since 1884. The administration, while nominally in the hands of a king and his officials, is supervised by the French resident, and the customs and finances are under the management of French officers. The local budget for 1900 balanced at 2,120,016 piastres, and the expenditures of France, on Anam and Tonquin combined, according to the budget of 1901, was 1,084,913 francs. Among the products

are rice, maize, and other cereals, cinnamon, sugar, betel, tobacco, and bamboo. Raw silk, coarse crêpe, and earthenware are manufactured. The principal imports are cotton goods, tea, petroleum, paper, and tobacco; the chief exports, cinnamon and sugar. In 1899 the imports were valued at 4,100,000 francs and the exports 6,500,000 francs. In 1900 a contract was made for the construction of a railway from Hué to Turan, a port about 50 miles to the south. See **INDO-CHINA**.

ANARCHY. The word "anarchy" is usually construed literally to denote a state of lawlessness; it is also used broadly and interchangeably with "anarchism" to define a series of allied theories in economic, political, and social science, of which the basic principle is the right of the individual to personal well-being, freedom from civil authority, and liberty of action in all social relations. As this idea of "individual rights," characterizing the entire group of theories, is or is not pushed toward its ultimate logical conclusion, the resultant theoretical system vacillates between that fanatical position where every man's hand is necessarily raised against every other, and those milder and long-held philosophical beliefs that the authority of society over the individual should be restricted within the narrowest limits requisite to preserve the social order. The several graduations by which the extreme belief defined correctly as anarchism merges into a tenable politico-philosophical concept are very numerous and have all had able defenders. Anarchism proper, on the other hand, has rarely been defended by thinkers of ability, for the reason that this belief constitutes in effect a protest against sentient life itself, this protest following from the fact that the history of civilization demonstrates conclusively that sentient life, both in its bulk amount and in its higher degrees of complexity, is absolutely dependent upon restraints imposed by every individual upon every other, that is to say briefly, upon the maintenance of social and governmental authority. Deriving their name from anarchism and endeavoring to defend their actions by that theory, there have been organized mainly, during the nineteenth century, small and generally unconnected bodies of men and women, principally in Europe, who have fostered and disseminated the most extreme anarchistic beliefs, and have in some instances incited their members to crime against those in authority in the State. Quite as often, however, so-called anarchistic crimes have been committed by single individuals, disowned by the anarchistic bodies proper, and endeavoring only from special personal reasons to put into effect the logical conclusion of the anarchistic belief. It is against these sporadic anarchists, quite as much as against the organized associations of anarchists, that restrictive measures have been devised in Europe.

The assassination of President McKinley (see **McKINLEY, WILLIAM**) on September 6, by Leon Czolgosz, an anarchist and a disciple of the notorious anarchist preacher and teacher, Emma Goldman, aroused an immediate and at the time passionate demand in the United States that Congress should enact laws at its next session sufficient to suppress the entire anarchistic brood throughout the country. It was pointed out that three presidents had been assassinated in thirty-six years—Lincoln in 1865, Garfield in 1881, and McKinley in 1901; that nests of avowed anarchists had existed for years undisturbed by State or national authority, in Paterson, N. J., in Chicago, Ill., and in other places; that hundreds of well-known anarchists, driven from European countries, were coming annually to the United States without let or hindrance; that every other great civilized country had devised the most stringent measures to suppress, expel, and punish anarchists, and still there was not a line on the statute books of the United States inimical to anarchists; and among the class of undesirable aliens which could be excluded from the United States under the immigration laws, anarchists were not included, the list being confined to "convicts, lunatics, idiots, and persons liable to become a public charge." To remedy this state of affairs, various and drastic measures were proposed, those most prominently advocated being (1) to prohibit all aliens known as anarchists from landing in the United States; (2) to deport all aliens and even naturalized citizens who subsequently became anarchists; (3) to suppress anarchistic societies, interdict their meetings, and punish their members; (4) to prohibit such scurrilous newspaper criticism of the government and of the President as might cause violent political feeling likely to incite light-headed persons to crime; (5) to surround the President with some more efficient bodyguard than one or two secret service men and the assumed goodwill of all people; and (6) to give to the federal government jurisdiction over criminal assaults upon the President and other high officials, and ambassadors and ministers of foreign governments, instead of, as at present, leaving the punishment of these crimes to the States in which they may be committed.

To the last of these proposed measures an almost spontaneous approval was given, both directly after President McKinley's assassination, when excitement ruled high, and at a later period, when a more critical spirit had begun to question the wisdom of some of the other recommended legislation. For it was recognized that whatever means of preventing anarchistic crime were finally judged to

be best, the punishment of anarchists at least should lie with the national authority against which the attack had been primarily made. Moreover, not every State could be depended upon to conduct a trial of worldwide interest with the sureness and swiftness of verdict that had characterized the trial of Czolgosz in New York. And for that reason, as well as because they properly belonged to the government, such cases should be vested in the federal courts alone. The other proposals, dealing in general not with the punishment but with the methods of preventing anarchistic crime, and endeavoring to legislate, as it were, against a frame of mind rather than against an overt act, opened up to discussion a series of vexed questions. For if the measures devised were to be aimed solely against anarchists, it might be said that the greatest danger did not lie there, two Presidents having been assassinated by men who were not anarchists, and the assassination of President McKinley by an anarchist being unique in the history of the country. Again, if the legislation proposed should be directed against the immigration of secretly plotting anarchists, it might be answered *a posteriori*, and judging by a single instance, that this would be of little avail, for Czolgosz was a native-born American. Or, if avowed and notorious anarchists were to be debarred from the United States, then the immunity obtained would seem still more doubtful, for it was a fact attested by the prolonged and bitter experience of Europe that the talking and preaching anarchist was a most harmless creature, amorous not of felling crowned heads but filling sheets of paper and of entertaining large audiences; it was rather the silent fanatic anarchist, unknown to the police, often low in the councils of his fellows, who could not be guarded against and who was to be feared. Again, if repressive measures were taken against anarchists wherever found, their meetings broken up and their members imprisoned, would not a more dangerous, because a more secret, form of anarchism ensue? "After the Barcelona outrages," the Duke of Arcos stated in the *North American Review*, "Spain adopted the most drastic measures in the hope that assassination could be stamped out. It was provided that any man responsible for explosions likely to cause death or serious bodily injury should be executed or sentenced to penal servitude for life. Severe sentences were provided for all persons, and especially newspaper editors, who advocated or condoned bomb-throwing. Anarchist societies were declared illegal, and the government was empowered to dissolve them wherever found. Trial in each case was to be by court-martial, in order to secure more expeditious punishment. All these measures had little or no effect. Almost on top of them came repeated new attempts, the record of recklessness being finally topped with the assassination of Canovas in 1897 by the anarchist Augiolilio." Finally, if military instead of legislative means of preventing assassination were taken, would the case stand better? In Europe, where all the resources of the military and secret service arms were employed to this end, assassinations and wholesale murders by bomb-throwing and otherwise were far more frequent than in the United States, and President Carnot of France was murdered while surrounded by a regiment of cavalry.

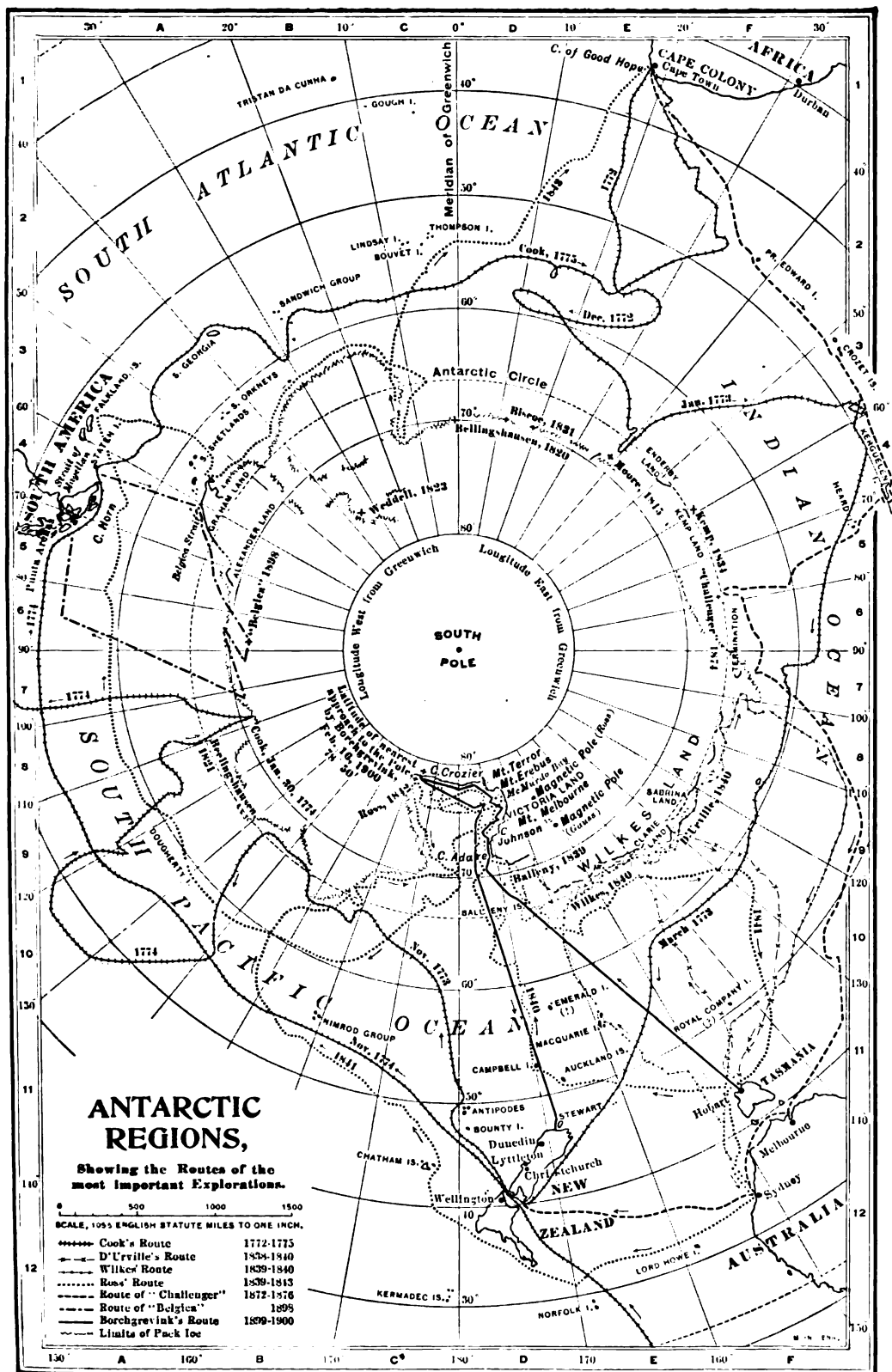
Besides these objections questioning the especial value of preventive measures against anarchistic outbreaks, other objections were advanced against them, based on the traditions and political genius of the United States. The right of free speech and all that that connotes was stated to be the basis upon which the civil institutions of the country were built up; and although this right might be so thoroughly abused as directly to incite crime and force the authorities to take action, as when the anarchists Johann Most and Emma Goldman were convicted under the laws of New York, a general federal statute delimiting the bounds of writing and speech-making would operate under this great disadvantage, that in all cases not absolutely clear, and especially if partisan political feeling happened to run high at the time and was in any way involved, acrimonious accusations would certainly be brought forward of laws bent to party use and of constitutional powers exceeded. How great a political feud might be engendered thereby was shown at the time of the arrest of Vallandigham by the military authorities during the civil war. How likely such a feud would be to arise unless the government acted with great discretion in moments of extreme provocation sure to come, might be judged from the fact that after President McKinley's death a set of daily papers which had been bitterly opposed to the President's administration were somewhat roundly accused of having been almost as morally criminal in their utterances as Emma Goldman was in hers, and it was asserted that the further publication of such personal political utterances should be stopped. But if before President McKinley's death Congress had passed a law authorizing the government to interdict such publications, and they had been interdicted, political dissensions of the gravest consequence would have been sown throughout the country. Two further arguments, based upon phenomena observed in the history of anarchism in Europe, were brought forward by those opposing drastic government measures to suppress

anarchists. The first of these, already alluded to, was that no sooner were open advocates of anarchism reduced to silence than a secret and more dangerous band took their place, glorying in their outlawry, fanned with its excitement, and prepared for any desperate measures on a wholesale scale that would secure them what they considered a martyr's death. The other fact observed about the anarchist was that he was almost invariably a person of the peasant class, educated above his station, and unable to realize his ideas and ideals in the plane to which he was almost necessarily limited. Given a prior tendency to emotionalism therefore, his crude and general notions unmodified by experience, almost naturally and unconsciously centred in the social system and in the desirability of overthrowing it. As the fundamental cause of anarchy, then, was the vivid contrast afforded by living in one condition of life, and appreciating, or rather over-appreciating, another and better condition and being unable to attain it, so it would seem that the rational cure for anarchism lay in the increase of general education, the increase of material well-being, and permission to all men to take part in the seemingly plumed and haughty government which was aimed against; at the same time keeping the plumes and hauteur so far in the background as the necessity of preserving public order permitted. Not only would this appear to be the rational cure for anarchism, but it was the traditional policy of the United States upon which its democratic institutions were founded, and by whose influence the turbulent and dangerous political elements mixed among the half million of emigrants who came to the United States yearly had become peaceable and well-ordered citizens. But if measures for the active repression of anarchists, such as would tend to turn American political institutions back to the type of those in Europe and would ultimately necessitate a large armed force within the country, should not be taken, at least it was conceded that there was no reason why the United States should not exercise the right exercised by every other government, and debar from the United States all those whom it deemed would make undesirable citizens; and in this class anarchists ought certainly to be included. For though their teachings were in general at once harmless and futile, yet, as shown in the case of Czigosz, they were not always so. And while a federal law hedging around in any way freedom of speech in the country might give rise to worse ills than it cured, the United States was by no means obligated to encourage wild and dangerous teaching by inviting the advocates of anarchism to make a home in this country.

ANDREW AND PHILIP, BROTHERHOOD OF, is an interdenominational order, founded in 1888, the object of which is the "spread of the kingdom of Christ among men." Its membership, distributed in more than twenty denominations and extending beyond the United States, numbers in this country 15,000 enrolled in 550 chapters. The federal convention in the fall of 1901 was held in Pittsburg, Pa. The organization publishes the *Brotherhood Star*. President, Dr. Rufus W. Miller; secretary, Rev. J. G. Hamner, Newark, N. J.

ANGLICAN CHURCH, otherwise called the Anglo-Catholic Church, is a term applied particularly to the Church of England, but includes in a general sense Protestant Episcopal churches in all lands which are derived from the established church of England. See **ENGLAND, CHURCH OF**; **IRELAND, CHURCH OF**; **SCOTLAND, CHURCH OF**; and **PROTESTANT EPISCOPAL CHURCH**.

ANGOLA, OR PORTUGUESE WEST AFRICA, a dependency of Portugal, bordering on the Atlantic for over 1,000 miles from the Congo Free State to German Southwest Africa. The estimated area is 484,000 square miles and the estimated population 4,119,000. The seat of government is the port of St. Paul de Loanda; the administration is in the hands of a governor and his subordinates appointed by the crown. The estimated revenue and expenditure in milreis (\$1.08) for the fiscal year 1900 were 1,673,111 and 2,013,671 respectively. The principal products include coffee, rubber, vegetable oils, wax, ivory, cattle, fish, cocoanuts, and sugar. The reported imports and exports in 1899 amounted to 6,314,846 milreis and 7,035,414 milreis respectively. The exports are largely taken by Portugal; the imports are supplied chiefly by Great Britain and Germany, the latter being now in the ascendancy. Economic conditions, however, were critical in 1901; the tariff of 1892 had proved disastrous to the colony, being advantageous to only a few Portuguese merchants and the owners of the line of steamers plying between Angola and the mother country. A railway is in operation from St. Paul de Loanda to the Lucalla River, 225 miles; an extension of about 124 miles was projected in 1901. A railway, about 20 miles in length, connects Benguella with Katumbella. In 1901 the construction of a railway from Benguella to Bihe was begun. According to a statement in the *Brussels Gazette Coloniale*, in April, 1901, the telegraph system of Angola was extended 1,000 miles during 1900. Among the present lines are those connecting Loanda with the Congo and with Novo



Redondo; a line from Mossamedes to Humpasa, 134 miles; Humpasa to Chibia, 30 miles; Dondo to Malange, 153 miles; Quinzau to the Congo, 135 miles. In 1901 a line from Novo Redondo to Dondo, 152 miles, was nearly completed.

In August, 1901, the British and Portuguese governments reached an agreement with regard to the undefined boundary between Angola and Barotseland, intrusting the delimitation of the frontier to a mixed Anglo-Portuguese commission.

According to a British consular report, the sale of alcoholic liquors in Angola has had a terrible effect on the natives; there seems to be little likelihood of abating the evil, since the rum industry is a large source of revenue to the colony. During 1901 the sleeping sickness continued its ravages. It has interfered seriously with industry; for example, the report just mentioned stated: "The margins of the River Coanza, which a few years ago were thickly populated, may now be traversed for hours without encountering a single native hut on shore or a canoe on the river. Whole villages, which a few years ago met the eye of the traveler by the railway, have entirely disappeared, due to the sleeping sickness."

ANTARCTIC EXPLORATION. The objects of the three Antarctic expeditions which set forth in 1901 are altogether scientific. There is not even a hint in the published plans of any of them that such a dramatic project as the discovery of the south pole is contemplated. In this regard, the plans of the Antarctic leaders are in sharp contrast with the plans of the Arctic leaders, who have frankly announced that their main object is the achievement of the adventure of the north pole, and that the collection of scientific data is merely incidental.

For about a quarter of a century scientific men have been importuning governments to send expeditions into the Antarctic regions. This modern agitation in favor of Antarctic exploration was begun by Dr. Neumeyer, was fostered by Dr. Petermann, of *Petermann's Mitteilungen*, by Dr. John Murray (now Sir John Murray), president of the Scottish Geographical Society, and a member of the *Challenger* expedition, and finally by Sir Clements R. Markham, president of the Royal Geographical Society. The interest of scientific men in Antarctic problems culminated in 1901 in the despatch to the south of an English expedition, a German expedition—both organized partly under government auspices—and a Swedish expedition, supported by private subscription, and besides these, in the promise of a Scottish expedition to the same region in 1902.

The Antarctic Problem.—Very little is known about the Antarctic regions. Before the Belgian expedition of '98-'99, no man had passed a winter south of the Antarctic circle, and fifty-five years had elapsed since a strictly scientific party had seen the Antarctic land, although the *Challenger* expedition crossed the Antarctic circle. Whether or no Wilkes Land and Victoria Land below Australia, Graham Land below South America, and the little Enderby Land below the Indian Ocean all extend south and unite in a continent, has not been ascertained. The supposition is that an Antarctic continent exists, but that has not been proved. Geographers are interested in this problem. Of course the interior conditions of such a continent, if it does exist, are unknown. It is probable that a vast ice-cap covers the whole region; and if this theory is borne out by the facts, the ice-cap is probably more like that which covered the northern part of North America during the glacial epoch than is the ice-cap of Greenland. Geologists are, therefore, interested in the phenomena of this great glacier, as well as in the character of the rock which has been discovered along the coast. Meteorologists are interested in the wind currents. The theory that a great anti-cyclone of northerly winds sweeps from the South polar regions has been advanced, but remains in doubt. These are geodetic problems to be solved. The land fauna and flora are known to be meagre, but their extent has not yet been determined. The investigations of the *Challenger*, however, and of other expeditions in the South seas had demonstrated that this region is exceedingly rich in sea life; and a prominent feature in the plans of all the expeditions is dredging at various depths. See ZOOLOGICAL EXPEDITIONS AND STATIONS.

The main problem to be solved, however, is that of terrestrial magnetism. The southern magnetic pole has not yet been definitely located, and until observations of the regions south of Cape Horn shall have been taken, the whole science of terrestrial magnetism remains at a standstill. There is, moreover, a direct commercial as well as scientific need for magnetic observations below the 40th parallel in the Indian Ocean. Vessels crossing from Cape Town to Australia have passed through regions of high magnetic activity, which have caused deviation in their compasses and thus thrown the ships off their course. Two of the expeditions go out with instructions to ascertain the exact localities in which this activity exists, and to determine, so far as may be possible, the conditions which govern it. Magnetic observations, then, are the main feature of all the expeditions, and in addition the Argentine Republic

has promised to establish a magnetic observatory on Staten Island, south of Cape Horn.

By agreement, the Antarctic regions have been divided, for purposes of exploration, among the nations. The best known region, Victoria Land, below New Zealand, has been selected by the British. The less known region, south of the Indian Ocean, has fallen to the lot of the Germans, and the Swedes have put up with Graham Land, which is furthest from the magnetic pole, and the most northerly of the coasts.

The National Antarctic Expedition.—The expedition organized by the British sets forth under the auspices of the Royal Society and the Royal Geographical Society, which raised most of the funds. In all, £100,000 was collected, of which the government contributed £45,000. About fifty thousand pounds of this money was spent in building and equipping the steamship *Discovery*, a barque-rigged vessel, 172 feet long, 33 feet beam and 16 feet draft. She is fortified with bulkheads and beams to resist ice-pressures, and is sheathed with greenheart, protected at the bow with metal plates. Her triple-expansion engines develop 570 horse-power. She is fitted out with a magnetic room, in the vicinity of which no iron was used in her construction, and with commodious laboratories for the use of the scientific staff. She is equipped with an electric-light plant, charged by a dynamo, which is to be worked in winter by a windmill. To keep out the cold, she has an asbestos lining an inch and a half thick, and a system of compartments, differently heated, separates her cabins from the open air.

The commander of the expedition is Capt. R. F. Scott, a torpedo-lieutenant in the British Navy. He will have charge of the magnetic observations. The meteorological observations will be in charge of Lieut. A. R. Armitage, R. N. R., the executive officer. The civilian staff consists of Dr. George Murray, the scientific director, T. V. Hodgson, biologist, William Shackleton, physicist, R. Koeltitz, botanist, and E. A. Wilson, geologist. All collections, logs, journals, charts, drawings, photographs, observations and scientific data are to be the joint property of the two societies. The commander is instructed to afford the scientific staff every opportunity to make observations and collections.

The objects of the expedition, as outlined in the instructions to Captain Scott, are (a) "to determine, as far as possible, the nature, condition and extent of that portion of the south polar lands which is included in the scope of your expedition; and (b) to make a magnetic survey in the southern regions to the south of the 40th parallel, and to carry on meteorological, oceanographic, geological, biological, and physical investigations and researches. Neither of the objects to be sacrificed to the other."

The commander was instructed to establish a magnetic station at either Melbourne, Australia, or Lyttleton, New Zealand, and to carry a magnetic survey from the Cape of Good Hope, south of the 40th parallel, to this station and again across the Pacific to the meridian of Greenwich. A sub-station was to be established, if possible, in Victoria Land, whither the *Discovery* was to proceed from the primary station. It was hoped that she could pass through the ice-pack north of Victoria Land in December, so that she might spend the Antarctic summer in finding a suitable spot for winter quarters. Winter quarters were to be established somewhere between Cape Johnson, north of Wood Bay ($74^{\circ} 25' S.$), and Cape Crozier, at the foot of Mount Terror. The expedition was then to examine the great ice-barrier discovered by Ross in 1842. This barrier presents a solid front of ice, rising 250 feet above the water. Ross followed it from Cape Crozier more than two hundred and fifty miles, and did not come to the end. Scientific men are not agreed as to whether it is the side of a long glacier, flowing down from the high land in that region, or whether it is the front of a wide glacier proceeding northward from a low, level country. Investigation of this mass of ice is to be the summer work of the expedition.

The winter party is then to be made comfortable on shore. Whether or no the *Discovery* is to return to open water or remain near the headquarters throughout the winter, is left to the discretion of Captain Scott. If she does not stay, she is to leave the scientific director, the physicist, a surgeon and men enough for sledge parties, furnished with provisions for three years. The three main sledge parties are instructed (1) to examine the volcanic regions near Mount Erebus, (2) to proceed southward as far as possible, and, most important, (3) to proceed westward between Capes Gauss and Washington toward the magnetic pole. If Captain Scott decides to winter his ship in the ice, it is reasoned that she should be able to force her way northward through the pack early in 1903, and in that case the leader is to proceed with his survey across the Pacific before returning to England.

The *Discovery* was launched March 21. She left the Thames for Cowes July 31. At Cowes, the King, the Queen and the Princess Victoria inspected her, and the King decorated the commander with the Victorian order. She sailed at noon August 6 for Cape Town, where she arrived October 3. She abandoned her trip to Melbourne, and instead proceeded to Lyttleton, New Zealand, touching on the way at

ANTARCTIC EXPLORATION.—Dr. Erich von Drygalski and the Crew of the *Gauß*.

Macquarie Island. She reached Lyttleton November 28, leaking badly, and was dry-docked. In dry dock she was caulked all over and launched December 16. Then it was found that she still leaked, forward under the iron sheathing; but the leak was not deemed important, and therefore she sailed December 21 from Lyttleton for Victoria Land. The last news of her was a telegram of farewell sent by Captain Scott from Port Chalmers, December 24.

The German Antarctic Expedition.—The German expedition is to cooperate with the British. It will cross the Antarctic circle somewhere below the Indian Ocean. Its primary magnetic base will be Kerguelen Island. At Three Island Harbor, in Royal Sound, it will establish an observatory. There five men will be left—a biologist, a magnetic observer, a meteorologist, and two sailors. Thence the expedition will steam southward and attempt to establish a station in some Antarctic land. Very little is known about the Antarctic region south of Kerguelen Island, but the Germans hope to reach the west coast of Victoria Land, and thence to sledge overland toward the magnetic pole. Their operations are not as clearly defined as those of the British; but June, 1904, has been fixed for their latest return to some seaport in communication with Germany. If no tidings shall have come from them by that time, a relief expedition will be sent out.

The funds for the German expedition have been supplied, partly by government appropriation and partly by private subscription. Through the influence of Count von Posadowsky-Wehner, secretary of state of the interior, the *Reichstag* appropriated about 40,000 marks for the expedition. The rest of the funds were raised by private subscription. A vessel was built expressly for Antarctic work and was launched April 2. She was named the *Gauss*, after the eminent mathematician whose work on *Terrestrial Navigation*, published in 1838, was the main stimulus to scientific investigation in the Antarctic regions. The *Gauss* is 151 feet long, 35 feet beam, and draws 16 feet; she displaces 450 tons. She is a three-masted schooner, fitted with triple-expansion engines which give her a speed of seven knots. Her lines are somewhat like those of the *Fram*. She is heated by steam and lighted by electricity.

The equipment of this expedition comprises provisions for three years, a wind-mill, a captive balloon, a naphtha launch, kites for meteorological work and outfits for observations in geodesy, magnetism, zoology—including dredges—meteorology, etc. Sledge journeys are to be a feature of the expedition, and fifty dogs have been supplied. The expedition is under the command of Erik von Drygalski, who will conduct the geological work. The scientific staff is made up of Dr. Ernst von Hoeffen, zoologist and botanist; Dr. Hans Gazert, medical officer and bacteriologist; Dr. Emil Philippi, geologist and chemist; Dr. Friedrich Bidlingmaier, magnetician and meteorologist. Their collections are to be the property of the German empire. The commander of the ship is Captain Hans Rusch, a captain of the Hamburg-American Line, and the engineer is A. Staho, who is also in the service of this line. The expedition numbers 32 men. The *Gauss* sailed from Kiel August 11, and arrived at Cape Town November 23, whence she started for Kerguelen Island.

The Swedish Expedition.—This expedition, organized and led by Dr. Otto Nordenskjöld, will establish a station, if possible, on the west coast of Graham Land, where the leader and the scientific staff are to pass the winter, sending their vessel meanwhile to make observations in the open water north of the pack. The funds are subscribed by private subscription, and the entire expenses are to be about \$35,000. The leader is a nephew of the famous Baron Nordenskjöld (*q.v.*), who made the first voyage around the northern extremity of Asia. Among the members of his staff is Mr. F. W. Stokes, artist of the Peary relief expedition of '92, and again of the Peary expedition of '93-'94. He is the only American who takes part in the Antarctic exploration of 1901. The expedition bought the steam-whaler *Antarctic*, which was used in Herr Bull's expedition, from which was made the first landing on the Antarctic continent. She was then officially in the whaling service. She was afterwards purchased by Professor Nathorst for his search expedition for Andrée, and then was bought by the Danish government for the expedition of Lieut. Amdrup. She is commanded by Captain Larsen, who has made several voyages to Graham Land. The expedition comprises 26 men, including a geologist, two biologists, a surgeon and observers of hydrographical magnetic meteorological and geographical phenomena. The *Antarctic* left Gutenberg October 16 and reached Buenos Ayres, whence she sailed for the Falkland Islands, December 20.

Delays in Sailing.—All these expeditions set forth from their bases rather late in the year, and there was a question among Arctic authorities whether they would accomplish during the Antarctic summer months of December, January, and February all that they have undertaken to do.

Plans of the Scottish Expedition.—Mr. W. S. Bruce, who visited the Antarctic regions in '92 in a whaling steamer, has made the announcement that in 1902 he will take the field in a whaler of 500 tons for exploration of the Weddell Sea, a region where in 1823, Captain Weddell penetrated below the 74th parallel and still saw an

ice-free ocean beyond him. The funds for this expedition, which is to cost £35,000, are to be obtained from private subscription. Mr. Bruce's plan is to cooperate with the other expeditions by establishing a scientific station in South Georgia. Thence his ship will proceed as far south as possible along the thirtieth degree of west longitude, but she will not winter in the ice. If land should be found Mr. Bruce might leave a party to make a sledge journey southward, but he proposes to send his ship into free water before the frozen season. The number of his party has not yet been announced, but his scientific staff will consist of five men. He has bought the steamship *Hecla*, which is being refitted by G. L. Watson, the designer of yachts.

ANTHRAX, or Malignant Pustule, is a rare disease in this country. It usually attacks those who handle hides, in which the anthrax bacillus is sometimes found. Gaining access to a hair-follicle or a sweat-gland, the micro-organism becomes the progenitor of a colony of bacilli, from which a specially virulent toxin is taken up by the blood. A small pimple appears, then the surrounding surface becomes red or purple, suppuration commences, and usually the patient dies in two or three days, suffering intense pain. Two cases of fatal anthrax occurred in November, 1901, in Hillsgrove, Pa., the victims being teamsters who were employed in hauling hides for a tanning company. Niemtschenkoff, in *Medicinskoie Obosrenie* for February, 1901, reports a case of anthrax, situated on the cheek, accompanied by great infiltration and severe systemic manifestations, which was cured by large injections of a 5-per-cent. solution of carbolic acid into the face. See **SERUM THERAPY**.

ANTHROPOLOGY. See **INDIANS**.

ANTICELTINA is a new compound formed by the union of urea with mercury, in the proportions of 43 per cent. to 4 per cent. It resembles bichloride of mercury in its effects, though painless when applied to the conjunctiva in a 1 to 2,000 solution. It has been used by Andreocci, Francaviglia and Capparelli in infective keratitis and iritis by subconjunctival injection.

ANTIMONY. The quantity of antimony produced from domestic ores in 1900 amounted to 151 short tons, valued at \$27,180, as compared with 243 short tons, valued at \$43,600 in 1899. The amount of metallic antimony produced by the smelters in the United States from both foreign and domestic ores in 1900 amounted to 1,750 tons, valued at \$346,980, as against 1,275 tons, valued at \$251,875, in 1899. This quantity represents about half of the amount actually consumed in the United States, the imports in 1900 amounting to 1,827 short tons, valued at \$287,937. The imported material was either in the form of crude antimony or regulus. The price of antimony in 1900 ranged from 9½ to 10 cents a pound for Hallett's brand and 10½ to 11 cents for Cookson's brand.

ANTITOXIN. Accompanying the development of certain bacteria in the body of man, during the progress of certain diseases, poisonous principles called toxins are thrown off by the bacteria or exist in the bodies of the bacteria. In nature's effort to combat these principles, substances are produced in the serum of the blood termed antitoxins, which neutralize the toxins. Antitoxins continue for a considerable period in the blood of individuals who have recovered from these germ diseases; and the serum of their blood may be used in inoculating others who are ill with the same diseases, to fortify them against the toxins which are at work. Several such antidotal serums have been isolated and verified, and are prepared for use in treating various diseases. (See **SERUM THERAPY**.) The first serum of this class in common use was the antidiphtheritic antitoxin, which has been widely though inaccurately known simply as antitoxin. Physicians in Paris hospitals have been experimenting with diphtheria antitoxin in enormous doses, in cases of pneumonia. The results in fifty cases, as reported by Talamon in March, 1901, have been very favorable; the duration of the pneumonia having been diminished, the chance of complications lessened, and the mortality lowered 10 per cent. In 25 cases, treated with the serum before the fifth day of the disease, but one death occurred, and this was a patient aged 72 years.

ANTIVIVISECTIONISTS. See **VIVISECTION**.

ARABIA, a peninsula in southwestern Asia, has an area estimated at from 1,000,000 to 1,230,000 square miles, and a population from 4,000,000 to 12,000,000, the lower estimates with regard to the inhabitants probably being the more nearly correct. The vilayets of Hedjaz (about 96,500 square miles) and Yemen (about 77,000 square miles) on the Red Sea are a part of Asiatic Turkey, and a strip along the Persian Gulf, extending as far south as Oman, and known as El Haza, is nominally under Ottoman authority. Aden (*q.v.*) in the south is a dependency of the British Bombay government, and Oman in the southwest, on the Persian Gulf and Arabian Sea, is an independent state, but under British influence. The interior is inhabited by tribes which acknowledge no rulers other than their own chieftains.

Hedjaz and Yemen have estimated populations of 300,000 and 750,000 respectively. In 1897 the trade, mainly imports, at the port of Jeddah amounted to about \$3,240,000; at the port of Hodeida, about \$6,900,000. A railway is being constructed from Damascus to Mecca, and in September, 1901, 80 kilometers had been laid. It is expected that this line will be connected with the Bagdad railway (German) now building. It is feared that opposition of the Arab tribesmen will cause considerable difficulty in the construction of the line, for before the end of 1901 they had repeatedly destroyed parts of the telegraph line that the Turkish authorities are carrying to Hodeida on the coast of Yemen. Oman has an estimated area of 82,000 square miles, and an estimated population of 1,500,000. The sultan is Seyyid Feysal bin Turki, whose seat of government is Muscat. A British political agent resides here. For the commercial year 1900 the imports were valued at 2,600,720 dollars and the exports 1,533,300. (The dollar is worth about 50 cents.) The principal imports were: Rice, 810,000 dollars; arms and ammunition, 445,150 dollars; grain, 244,670 dollars; and piece goods, 224,000 dollars. The leading exports were: Dates, 630,200 dollars, and cotton fabrics, 159,000 dollars. Over 80 per cent. of the trade is with India and Great Britain.

The Troubles in Koweyt.—Koweyt is a town on a bay at the head of the Persian Gulf, 80 miles south of Basra. In April, 1901, there was a report, afterwards confirmed, that Mubarakh, the sheikh of Koweyt, had been defeated in battle by Ibn Rashid, sultan of Nejd, central Arabia, whom shortly before he had deposed. The report stated that 5,000 men fell in the battle. Down to 1870 Koweyt was really, if not formally, independent, and even since that year the sheikh has not acknowledged the political, but only the religious, authority of the Ottoman government. For some reason, probably with the hope of increasing his inadequate revenues, the Turkish Sultan seized the opportunity, after the sheikh's defeat, to attempt the establishment of formal authority in Koweyt. Mubarakh seemed to realize this design when in June, 1901, upon stating his intention of continuing hostilities with the ruler of Nejd, he declined to accept the assistance of Turkish troops and asked for a proclamation of British protection. There were a number of Turkish troops at Basra, but it appears that these could not easily advance against Koweyt by land; accordingly an attempt was made by sea, but the landing of the troops was frustrated (August 24) by the menacing presence of a British gunboat. In September, Turkey was reported to have 30,000 troops in Basra; these, it was said, were intended to march across Arabia in order to suppress disaffection in Yemen, but the explanation was not taken seriously. By the middle of October, 1901, the Nejd tribesmen were ceasing to menace Koweyt and the situation in general was reported to be quiet, but late in December the whole question was reopened. It was then announced that the Sultan of Turkey had sent a special emissary to Koweyt to summon Mubarakh to Constantinople to make obeisance to him as his suzerain. The Sultan promised various honors to the sheikh on his compliance with the summons, but threatened to remove him should he refuse. The sheikh, it was reported, fearing such an order, refused to allow the emissary to land. He was probably aware that "many have been called to Constantinople and received with hospitality so profuse and prolonged that they have never had an opportunity to enjoy their honors among their own people." It is not improbable that the Sultan's power to remove the sheikh is inadequate. About the same time it appeared that Ibn Rashid, the sultan of Nejd, had made preparations to renew his attack upon Koweyt in the interests of Turkey, and accordingly Mubarakh had appealed again for British protection. British vessels in the Persian Gulf seemed able to maintain the *status quo*, the continued existence of which the British government seems determined upon; for, though Koweyt is of no agricultural and little commercial importance, it has a real value on account of its position as a possible naval base. It was surprising that the Sultan, even though greatly in need of additional tribute, should attempt to exercise any constraint upon Mubarakh (and thus antagonize British interests), over whom his suzerainty is merely nominal, at a time when the Porte was experiencing many troubles of an exceedingly serious nature. Turkey had just received a severe lesson from France, friction with the United States seemed possible, the attitude of Bulgaria was discontented, not to say menacing, and open anarchy prevailed to a considerable extent in various parts of the empire—in Macedonia, Albania, Armenia, and to some extent on the Red Sea littoral. In December, 1901, the rumor that Great Britain was about to declare a protectorate over Koweyt called forth unfavorable comment in the German and Russian press. Since Koweyt will probably be the southern terminus of the Bagdad railway (German), Germany is decidedly opposed to its possession passing to Great Britain. For the question of Russian influence in the Persian Gulf, see PERSIA (paragraphs on History).

ARABI PASHA. See EGYPT.

ARBITRATION, INTERNATIONAL. While no international disputes of great importance were decided by, or referred to arbitration during the year 1901,

still the "arbitration idea" has become more generally recognized by statesmen and diplomats than ever before. The permanent international laws of arbitration, proposed by the Hague Conference of 1899, came into existence with the ratification of the conference's action in 1900, and the subsequent appointment of members by the fifteen signatory powers. On April 14, 1901, Dr. W. H. de Beaufort, the Netherlands minister for foreign affairs, and ex-officio president of the new tribunal, notified the powers that the court had been duly constituted. The heads of the delegations named by the fifteen countries were announced as follows: Austria-Hungary, Count Frederic Schonborn, president of the imperial royal court of justice; Belgium, M. Beernaert, former prime minister; Denmark, Professor L. Matzeen, president of the Copenhagen University and president of the *Landsthing*; France, M. Léon Bourgeois, ex-minister for foreign affairs; Germany, Herr Hingner, president of the imperial high court at Leipzig; Great Britain, Lord Pauncefoot, ambassador at Washington; Italy, Count Constantin Nigra, ambassador at Vienna; Japan, Mr. I. Montono, minister plenipotentiary at Brussels; Netherlands, Professor T. M. C. Assen, formerly professor of international law at the University of Amsterdam; Portugal, Count de Macedo, minister to Spain and ex-minister of marine and colonies; Roumania, M. Theodore Rosetti, ex-president of the high court of cassation; Russia, M. Pobiedonostzeff, procurator of the holy synod; Spain, Duke of Tetuan, ex-minister for foreign affairs; Sweden and Norway, Mr. S. R. D. K. d'Olivecrona, ex-associate justice of the supreme court of Sweden; the United States, ex-President Benjamin Harrison (died March 13, 1901). The other American members of the court named were Melville W. Fuller, chief justice of the Supreme Court; John W. Griggs, at that time United States attorney-general, and George Gray, ex-senator from Delaware and a judge of the United States Circuit Court. An Administrative Council, permanent at the Hague, comprises the Netherlands minister for foreign affairs as president, and the diplomatic representatives of all the signatory powers at that capital. The Council will have the functions of an international bureau, acting as a medium of communication between the powers, and employing the requisite minor officers necessary for carrying on the routine work of the tribunal.

The only appeal made to the court during 1901, that lodged by the representatives of the Boer republics in Europe, was disposed of by the Administrative Council without submission to the court. The Boers urged that the court take action on the ground that Great Britain had continuously violated the rules of civilized warfare. The Administration Council, replying on October 1, declared unanimously that it was without power to initiate an arbitration between the Boer republics and Great Britain. The international court, it was pointed out, is not a court higher than all governments, empowered to summon nations to its bar for judgment, but is a body having power to act only when both parties voluntarily and formally agree to submit their difference to it. Suggestions were made at two other times during the year for the submission of international questions to the court, but neither of them were acted upon. One was the proposal of Mr. W. W. Rockhill, special commissioner of the United States to China, that the question of the amount and the equitable division of the Chinese indemnity be submitted to the court. Although Japan apparently favored the proposition, the other nations would not agree to it, and nothing was done about it. Later in the year it seemed possible that the court might be called upon to give a decision in two minor disputes between France and England. Arrangements had already been made, however, by the two governments to submit the matter to Baron Lambermont, the Belgian minister for foreign affairs; and although there was some protest that this action was irregular, and that the powers, being signatories of the Hague conventions, should have laid their disputes before the permanent international court, no change was made.

Most of the sessions of the Pan-American conference (see MEXICO) in the city of Mexico, between its organization on October 26, 1901, and December 31, following, were consumed in discussing a plan of international arbitration similar to that adopted at the Hague conference, to be binding on the various countries of North, South and Central America. On June 17, 1901, the United States and Chilean Claims Commission, completed its work after having heard arguments on seventeen cases against Chile and two against the United States. The Commission allowed \$28,062 on a total of \$3,400,000 American claims. One of the Chilean claims for \$3,000 was allowed, and the others dismissed. Provision was made in 1901 for the submission of several other South American disputes to the arbitration of commissions or individuals. A commission began in August to examine into the demarkation of the boundary line between Brazil and Argentina; on November 6 a treaty was signed between Great Britain and Brazil, by which the King of Italy was made arbitrator in the boundary dispute between British Guiana and Brazil; a protocol was signed at Le Paz on November 26, submitting to arbitration the pending questions between the two republics of Bolivia and Peru, and the differences between Argentina and

Chile, which threatened to precipitate hostilities, were referred to the same British commission appointed in 1896 to settle other disputes.

In November a British-Italian commission, appointed to settle the boundary dispute between the Italian colony of Eritrea and the Soudan, began its sittings at Rome. Efforts were made by the Siamese government several times during the year to secure the consent of France to submit to arbitration some of the questions involved in the territorial dispute between Siam and French Indo-China (see SIAM). The proposal made by Siam, of the Czar of Russia as an arbitrator, was rejected by France; the Russian minister at Bangkok also opposed the plan, allowing it to be understood that the Czar would decline to act.

The seventh annual conference on international arbitration met at Lake Mohonk, New York, in the first week of June, 1901. After a discussion of many questions relating to war, and taking a very optimistic view of most of them, the conference decided to use every influence to get nations into the habit of using the newly established international court of arbitration. Much stress was laid on the point that, if the powers should get into the way of using it as a means of settling their minor disputes, they would be more likely to have recourse to it than to war when more serious differences should arise.

ARBITRATION, LABOR. The strike (See articles STRIKES and STEEL TRUST STRIKE) of most of the members of the Amalgamated Association of Iron, Steel and Tin Plate Workers who were employed by the United States Steel Corporation, and the breaking by the Amalgamated Association of contracts which it had signed with various of the constituent companies of the Steel Trust, raised anew in the United States the discussion as to the best means of averting such controversies between labor and capital, and especially as to the inherent but generally overlooked rights of the public in the premises. It was suggested in the first place that labor organizations ought to be duly incorporated concerns, with power to sue and be sued as such, thus giving them a corporate standing before the courts and permitting employers to obtain redress from the unions when contracts were broken without a just cause, instead of compelling the employers, as at present, either to suffer an absolute loss or fruitlessly sue the individual members of the labor organizations. In the second place, a considerable portion of the press considered that in strikes of such magnitude as that of the Amalgamated Association, where the public suffered heavily through the wholesale suspension of production, boards of arbitration should be appointed by State or federal authority, with power to examine and render a decision upon the facts and merits of the case. If the board was an able and impartial one, its decision when made public, even if the decision was not held binding upon either party, would have great weight in directing public sentiment and would thus tend to force concessions from one or both of the parties to the dispute. A portion of the more radical press, however, thought that the arbitrators' award should be made binding for a time specified by law, and that until the expiration of this time a resumption of work should be forbidden except upon full compliance with the board's findings. In objection to this plan it was pointed out that if the parties who alone knew intimately the condition and complications prevailing, and who penalized themselves heavily by continued misunderstanding, were still unable to arrive at a satisfactory agreement, there was but little chance that outsiders could do so. Moreover, employers could not be expected, merely upon an *ex cathedra* ruling, to continue to run their plants at a loss, or if they thought that under it they would be subjected to continual annoyance, nor would employees remain at work if they believed themselves underpaid, or overworked or unjustly treated. Speaking for organized labor in this connection, President Mitchell, of the Anthracite coal miners, said in Scranton in October, 1901, that compulsory arbitration of necessity implied a resort to some judicial tribunal; that the laboring men believed the judiciary to be prejudiced on the side of vested interests which they were constantly engaged in conserving and defending; and that under these circumstances the decision of a tribunal of arbitration would work to the prejudice of the workmen. On the other side, from the standpoint of unorganized labor, it was pointed out that compulsory arbitration would be equally disadvantageous; for if the law did not actually require it, yet the effect, in practice, would be that only labor unions, as such, would have a standing before the court. Unorganized labor, therefore, would be, as it were, outside the pale of the law, and consequently unorganized laborers would either be forced against their will to join a union or else to remain unprotected in their disputes with their employers. As instancing both this point and also the generally unsatisfactory working of compulsory arbitration, the effect of the arbitration laws in New Zealand was frequently adduced. But however the action of this court may appear to outsiders, it should be added that its workings seem fully endorsed by those most immediately concerned. A special commissioner appointed by the government of New South Wales

to examine the system reported very favorably upon it in 1901, as follows: "The act has prevented strikes of any magnitude, and has, on the whole, brought about a better relation between employers and employees than would exist if there were no act. It has enabled the increase of wages and the other conditions favorable to the workmen, which, in the circumstances, they are entitled to, to be settled without that friction and bitterness of feeling which otherwise might have existed; it has enabled employers, for a time at least, to know with certainty the conditions of production, and therefore to make contracts with the knowledge that they would be able to fulfill them; and indirectly it has tended to a more harmonious feeling among the people generally. . . . A very large majority of the employers of labor whom I interviewed are in favor of the principle of the act." The results of four years' operation of the New Zealand law appear in the following table:

YEAR.	SETTLED BY CONCILIATION BOARDS.	SENT TO COURT OF ARBITRATION,	TOTAL CASES.
1896-1897.....	3	4	7
1897-1898.....	4	16	20
1898-1899.....	8	17	25
1899-1900.....	14	20	34
	—	—	—
	29	57	86

But whether or not the New Zealand method of preventing labor disputes was to be finally adjudged as the best, it was generally recognized that arbitration in some form was becoming necessary to the United States, and various efforts were made during the year to solve the problem, at least in part, both by State governments and by private individuals or associations. Some interesting State laws passed in 1901 and bearing on this subject will be found in the article LABOR (paragraph Labor Legislation). The most notable unofficial movement looking toward the possible settlement of labor disputes will be found in the following paragraph dealing with the National Civic Federation.

Organization of the National Civic Federation.—A meeting of the National Civic Federation was held in New York on May 7 and 8, 1901, to consider the report of the national committee on conciliation and arbitration created at a convention held in Chicago in December, 1900. A large number of prominent representatives of labor and capital were present. The scope of the committee was defined as follows: "The committee will secure the fullest possible information as to methods and measures of arbitration in vogue throughout the world; it will put itself into communication with all representative bodies of men and employees, inform them as to its purpose, offer its services and secure their cooperation and good-will if possible, asking particularly of general organizations that whenever any specific questions are arising where there is no established method of joint consideration and settlement existing, the national committee be informed, in order that it may use its influence before trouble occurs. This method may be extended to local organizations when the committee may find itself sufficiently equipped to do so." A second meeting of the federation was called in December, in New York City, to consider the same subject. At this meeting the following board of arbitration was appointed:—*Capitalists:* Marcus A. Hanna, United States senator; James A. Chambers, president National Association of Store Manufacturers; S. R. Callaway, president American Locomotive Company; Lewis Nixon, president and owner of the Crescent Shipyard, Elizabethport, N. J.; Charles M. Schwab, president United States Steel Corporation; H. H. Vreeland, president Metropolitan Street Railway Company; Charles A. Moore, president of the Machine Manufacturing Company; John D. Rockefeller, Jr.; E. P. Ripley, president Atchison, Topeka, and Santa Fé Railway; Julius Kruttschnitt, general manager Southern Pacific Railway; Marcus M. Marks, president National Association of Clothing Manufacturers. *Labor Leaders:* Samuel Gompers, president American Federation of Labor; John Mitchell, president United Mine Workers' Association; Frank P. Sargent, grand master Brotherhood of Locomotive Firemen; Theodore J. Shaffer, president Amalgamated Association of Iron, Steel, and Tin Workers; James Duncan, secretary Granite Cutters' Union; Daniel J. Keefe, president International Association of Machinists; Martin Fox, president Iron Moulders' National Union; James M. Lynch, president International Typographical Union; Edward E. Clarke, grand master Brotherhood of Railway Conductors; Henry White, secretary Garment Workers of America; Walter MacArthur, editor *Coast Seamen's Journal*, San Francisco. *For the General Public:* Ex-President Grover Cleveland, Archbishop John Ireland, Bishop Henry C. Potter, Mr. Charles Francis Adams, Hon. Cornelius N. Bliss, President Charles W. Eliot, Mr. Franklin MacVeagh (Chicago), ex-Con-

troller James H. Eckels, Colonel John J. McCook (New York), Mr. John G. Milburn (Buffalo), Mr. Charles J. Bonaparte (Baltimore); Hon. Oscar S. Strauss, chairman of the conference; Mr. Ralph M. Easley, secretary ex-officio. A sub-committee of the general committee, consisting of 11 members, was also established, to be known as a labor court. Of this committee Senator Hanna was appointed chairman. The official statement of the plan and scope of this committee is as follows: "This committee shall be known as the industrial department of the National Civic Federation. The scope and province of this department shall be to do what may seem best to promote industrial peace, to be helpful in establishing rightful relations between employers and workers, by its good offices to endeavor to obviate and prevent strikes and lockouts, to aid in renewing industrial relations where a rupture has occurred. That at all times representatives of employers and workers, organized or unorganized, should confer for the adjustment of differences or disputes before an acute stage is reached, and thus avoid or minimize the number of strikes or lockouts. That mutual agreement as to conditions under which labor shall be performed should be encouraged, and that when agreements are made, the terms thereof should be faithfully adhered to, in both letter and spirit, by both parties. This department, either as a whole or as a sub-committee by it appointed, shall, when requested, act as a forum to adjust and decide upon questions at issue between workers and their employers, provided in its opinion the subject is one of sufficient importance. This department will not consider abstract industrial problems. This department assumes no power of arbitration unless such powers be conferred by both parties to a dispute. This department shall adopt a set of by-laws for its government."

Report of Industrial Commission on Arbitration.—The United States Industrial Commission, in October, 1901, published a summary of its forthcoming report on labor organizations, labor disputes, and arbitration. The report was prepared by Mr. Charles E. Edgerton and Mr. E. Dana Durand. The introduction to the summary presents a general view of the subject of arbitration. The two chief classes of industrial difference which may be settled by peaceful methods are: (1) those which concern the interpretation of the existing terms of employment; (2) those which are concerned with the terms of future employment and which are usually of greater importance. The most common method of settling such disputes does not involve a resort to arbitration or conciliation, and is known as collective bargaining, or peaceful negotiations between organized labor and the employers, usually carried on by "joint conferences" and confirmed by written agreements. When for any reason the method of collective bargaining cannot be relied on to settle the dispute, resort is naturally had to "conciliation," which is a term applied to the disinterested action of a third party in bringing together the two parties to the dispute for a friendly discussion and possible settlement of differences. When no agreement can be reached by this method, the next recourse is to the judgment of a third party, the arbitrator, who hears both sides and gives his decision, which the parties to the dispute may either reject or accept where the arbitration is voluntary, or which may be enforced by the courts where compulsory arbitration is the rule. A variation of this method is found in the decision of particular issues in dispute by boards composed of an equal number of representatives of employees and employers, who are not immediately concerned in the dispute and are therefore largely free from personal bias or animosity. This method is called "arbitration within the trade." In cases where an open breach has occurred, "mediation" is resorted to. This is the intervention of outside parties presumably acting in the public interest to bring about a conference and a resort to some means of peaceful settlement. "The most important results which have been accomplished by collective bargaining, conciliation, and arbitration have been in preventing cessation of employment. Differences which do not lead to open rupture are less conspicuous to the general public than prolonged strikes and lockouts, and the enormous importance of those settlements which are effected without any cessation of labor is often overlooked." The other topics treated in the report are as follows: I. Local collective bargaining; arbitration and conciliation, largely of an informal character. II. Formal systems of collective bargaining and agreements, between central organizations of employers and employees: (a) methods of adopting agreements by joint boards and committees; (b) terms of joint agreement as to time of duration, regulation of apprenticeship, rights of unionists, shop committees, and working cards, exclusive employment of unionists, and the union rate of wages. III. Local arbitration, conciliation, and mediation; (a) method of selecting arbitrators; (b) method of procedure in arbitration proceedings; (c) policy of disputants in regard to wages or employment pending decision and methods of carrying out decision. IV. Formal national systems of collective bargaining and arbitration; (a) extent of collective bargaining systems which are general in strong unions, by methods of organization and procedure in collective bargaining,

either by customing practice or agreement,—(1) methods of selection and number of representatives on each side, the method being usually representative and the number of workmen necessarily greater; (2) methods of discussion and agreement usually by joint session with reference of disputed points to separate sessions; (b) nature of agreements as conditions of labor,—(1) either uniform or less frequently varying with special conditions, (2) involving sliding scale or fixed wage, (3) nature of recognition of union (a) arbitration as to specific disputes, of a union and local character where provision is made for settlement within the terms of the general agreement. V. Collective bargaining and trade arbitration in Great Britain, where there were in 1899, 53 regularly established joint boards or conferences in operation, and where in 1899 disputes affecting 379,285 persons were settled. VI. Governmental arbitration in the United States; (a) State arbitration organized in 14 States; (b) local boards of arbitration and conciliation; (c) United States statutes, 1888 and 1898, the latter providing for reference of disputes on interstate transportation lines to the chairman of the Interstate Commerce Commission and the United States commissioner of labor, who may appoint a third arbitrator, their decision being binding; (d) working of State boards of arbitration, which is stated to be very imperfect, the boards in only a few States being active, largely because of a general ignorance of their existence. VII. Governmental arbitration in foreign countries, as yet of little consequence outside of Australia and New Zealand, where its operation is stated to be generally satisfactory.

ARBUTHNOT, FORSTER FITZGERALD, English Orientalist, died in London, May 25, 1901. He was born in England in 1833, and was for many years a member of the Council of the Royal Asiatic Society. It was at his suggestion and with the help he gave that the society's annual publication of Oriental translations was revived in 1888. Mr. Arbuthnot was editor of the series until shortly before his death, and had published under his own name a number of works, one on Arabic literature, and another on *The Credibility of our Accepted Chronology*.

ARCHÆOLOGY. I. Babylonia.—Though exploration and excavation have continued in Babylonia during 1901, as in previous years, the published results are practically confined to the German expedition under Dr. Koldewey at Babylon, whose frequent reports are published in the monthly *Mitteilungen der deutschen Orientgesellschaft*. The work has been carried on at three of the great mounds which cover the site of the ancient city, El Kasr, Tell Amrân and near the modern village of Jumjuma. El Kasr covers the palace of Nebuchadnezzar and the complete excavation will consume a long time, but gratifying results have already been obtained. Stone was scarce in Babylon and the alabaster reliefs which adorned the palaces of Nineveh were replaced by enameled bricks, such as were already known from the excavations of Dieulafoy at Susa. From the mass of fragments which had once lined the inner wall the figure of a superb lion has been completed, 1.95 m. long and 0.90 m. high. The background is dark blue, with yellow stripes and white rosettes, while the lion himself is white. Of the palace, a large court has been discovered, richly decorated with glazed bricks, showing flowers and tendrils, and others having the outlines marked by glass threads, while the body of the design is filled with colored enamel. More important still is the latest report, according to which Koldewey has found the actual throne-room of the king, a huge hall 18 m. broad and 52 m. long, with a niche at one end for the throne, and at the other the great entrance door. The decorations are said to be well preserved, and of the greatest importance for the history of art. From the outside of the palace ran the great street of processions in honor of Marduk (or Merodach), which was rebuilt by Nebuchadnezzar, as the inscriptions on many of the limestone paving-slabs declare. It was about 25 m. wide, and was over a quarter of a mile in length, though its entire course is not yet cleared. The building of this street, Aibur-shabu, from the gate of the palace to the temple of Ishtar (of which the site has also been determined), is mentioned in an inscription of Nebuchadnezzar, now in England. In the mound Amrân, it has been necessary to dig deep in order to reach important results, but the toil has been rewarded by reaching the famous Esagila, a Babylonian Pantheon, where around the temple of the great god of Babylon, Marduk, were grouped the shrines of many lesser deities. New material for a railroad, so necessary for the removal of rubbish from deeply buried ruins, has arrived and the work at this great sanctuary is to be pushed with vigor. At the third point, near Jumjuma, the most important discovery seems to have been a mass of inscribed clay tablets, containing letters, contracts, dictionaries and hymns, all of much importance for the language and religion of Babylonia, and for the better understanding of the Old Testament. Among the smaller objects found is a tablet containing a representation of the Babylonian Hades, with an inscription of some length, and a tablet with the hymns or prayers sung when Marduk returned from a solemn procession to his temple. In general, the excavations have yielded a comparatively small number of small

objects, but as the explorers penetrate into the interior of the palaces and temples the number of works of art and especially of documents is likely to increase.

The American excavations at Nippur, under the direction of Professor Hilprecht, of the University of Pennsylvania, have been temporarily suspended, in order to allow the study and arrangement of the mass of material already recovered, but they are to be resumed in a short time on an even more extensive scale.

II. Palestine and Syria.—The work of the Palestine Exploration Fund during the past season has been confined to such studies as can be pursued without special permission; for as yet the Turkish government has failed to issue the promised firman for excavations at an unnamed site, which is described as likely to yield much information on the pre-Israelitish and early Jewish periods and possibly on the puzzling Philistine problems. A museum has been established by the Turkish government in Jerusalem, where the lesser objects found by Dr. Bliss and other explorers are to be preserved. This is in accord with a new policy, which has in view the establishment of local museums at various points throughout the empire for the preservation of such antiquities as are not of sufficient importance to be brought to Constantinople. Konieh and Bagdad have also been designated as sites for such museums, and others will probably be added. The Imperial Museum has also taken part in excavations, having conducted during the summer an examination of Bostān esh-Shaykh near Sidon. The work was in charge of Makridi Bey, who had previously represented the government at the German excavations at Baalbek. The trenches brought to light the foundations of a Phœnician temple dedicated to Eshmun, and a mass of sculptures in stone, vases, terra-cotta, inscribed gems, etc. Most of the objects are of the Hellenistic period; but there are several Phœnician inscriptions, one of which gives the name, Bad-'Ashtoreth, of the hitherto unknown grandson of Eshmun'azar.

Two lesser discoveries are of some importance. The aqueduct near Jerusalem, which has been variously attributed to Solomon, Herod and Pilate, has been carefully examined and several Latin inscriptions found, which show that it is much later than had been supposed, as it was built in 195 A. D., during the reign of Septimius Severus for Ælia Capitolina, the Roman city, which occupied the site of Jerusalem. While traveling in the Hauran, Dr. George Adam Smith discovered at Tell esh-Shibâb, a basalt slab with an Egyptian inscription of Seti I., thus furnishing a new point in the extension of the Egyptian conquests towards the northeast before the Israelitish occupation of Palestine.

The past year also brought the publication of a preliminary report of an American expedition, which in 1899-1900 made a careful exploration of the region of central Syria, east of the Orontes and in the Hauran, visited by Count de Vogüé in 1861-62, and almost wholly neglected since that time. The expenses of the expedition were provided by four New York gentlemen, and the party consisted of Messrs. R. Garrett, W. K. Prentice, and H. C. Butler, of Princeton University, and Dr. Enno Littmann, of Oldenbourg, to whom were added later Mr. H. M. Huxley as anthropologist, and Dr. George E. Post, of Beirût. The mountain region of northern central Syria was entered from Antioch, and carefully explored, the numerous inaccuracies of the maps corrected, inscriptions copied, and a large number of photographs taken. The importance of the region lies in the large number of ancient towns, now deserted, but flourishing down to the end of the sixth century of our era, and abounding in well-preserved remains of churches, tombs and especially of the domestic architecture, which is nowhere so well represented unless at Pompeii. The houses, of two, three and even five stories in height, belong to all classes of society, and with the public buildings, furnish material for an important but hitherto obscure chapter in the history of the transition of architecture from the later classical to the Byzantine period. In the northern parts of this region the material is an easily worked limestone, while toward the south a hard basaltic rock is used, leading to a totally different architectural treatment, a fact still more plainly marked in the Hauran, where the basalt is also common, but not made clear in the work of previous explorers. Inscriptions in eight different languages were found, including 386 in Greek, less than half of which were previously known, and some of these only in inaccurate copies. The Syriac inscriptions are regarded as of great importance epigraphically, as such documents are very rare. The Nabatean inscriptions include one of the earliest known from the northern kingdom (5 B. C.), and Dr. Littmann was so fortunate as to find a number of examples of the rude Safaitic writing, including some new forms of letters and a number of complete sentences, which are especially valuable, as the previously known specimens had consisted almost wholly of proper names. An elaborate publication of the results is in preparation at Princeton. See *American Journal of Archaeology*, IV. (1900), pp. 415-440.

III. Egypt.—As in the past, Egypt continues to be the favorite field of excavators. Not only is the land full of unexplored and comparatively accessible sites, but the liberal policy of the government in permitting a considerable part of

the objects found to be removed to other countries, only reserving those of special importance for the Museum at Gizeh, naturally attracts expeditions largely dependent on private subscriptions. It is certainly true, though regrettable, that it is hard to secure funds for the mere increase of human knowledge, if no tangible returns can be secured by the contributors. Apart from these considerations, however, the long duration of Egyptian civilization, and its connection with that of the West, both in the remote past of the Stone and Bronze Ages and in the Græco-Roman and early Christian centuries, makes it an important subject of study for many others beside the specialists in Egyptology. This activity is shown by a list of eighteen permits issued to excavators by the Committee of Archæology, while the agents of the Museum worked at six other sites, and native Egyptians were allowed to carry on some small excavations. In general it has been the wise policy of M. Maspero to prevent so far as possible unauthorized digging, and to authorize only such expeditions as seem likely to be conducted in a scientific manner. In spite of these efforts the grave robbing by the peasants and Arabs is by no means suppressed, as stories of the dealers in antiquities show only too clearly. Of course objects placed on the market with no true statement as to their prominence and the exact circumstances of their discovery, are mere curiosities almost devoid of scientific value, but unfortunately none the less attractive to the tourist. The chief work of the Department of Antiquities is the preservation of the monuments already discovered, and the chief scene of its activity has been at Karnak, where it has had two special objects in view—the raising of the fallen columns and the inclosure of the ruins. In both of these good progress has been made. The foundations of the columns have been cleared and made secure, and one of the two villages, whose presence interferes with the inclosure, has been purchased and removed, while the other is to follow in 1902. This work of clearing and repairing has led to the discovery of some good statues. It is reported, however, that the damage done by floods will necessitate much labor in strengthening the monuments. Another important task has been the preparation of the General Catalogue of the Cairo Museum, which was begun in 1896 by an international commission, and of which two volumes have appeared, containing the *Ostraka* by Daressy, and the *Bronze Vessels* by von Bissing, while other volumes are in the press or completed in manuscript. The complete work will probably require twenty or thirty volumes. It is intended to include a complete account of the origin and history of each monument, so far as the records allow, the reproduction of the more important hieroglyphic inscriptions, and phototype reproductions of all objects of special interest.

The Egypt Exploration Fund and Egyptian Research Account have worked chiefly at Abydos and its neighborhood. At El'Amrah two prehistoric cemeteries and one of the Eighteenth Dynasty were carefully excavated; their importance seems to lie chiefly in the evidence they furnish of the passage from the prehistoric age to the tombs of the First Dynasty, between which a gap had previously been assumed. At Abydos, Petrie continued the excavation of the royal tombs of the First Dynasty, and as usual has promptly made his discoveries accessible by the publication of Part II. of *The Royal Tombs of the First Dynasty at Abydos*. Of the fourteen kings whose tombs have been discovered, four are assigned to the period before the First Dynasty, eight to that dynasty, and two, Perabsen and Kha-sekhemui, to the Second. In general it must be admitted that there is considerable difficulty in identifying the names with those assigned to the early dynasties by Manetho and the table of Abydos, but many indications derived from the arrangement of the tombs and the differences in style make the general principles of the succession probable. It should be noted, however, that Foucart proposes to identify Narmer, one of Petrie's predynastic kings, with the first king of the Second Dynasty; Petrie's chronology, which dates the earliest tombs in the neighborhood of 4800-4500 B.C., has also been called in question. While the discoveries of recent years have thrown a flood of light on the early civilization of Egypt, which can now be traced from the end of the Stone Age to the time of the Second Dynasty, and have made it very probable that no foreign conquest disturbed the native development, the chronological data are by no means certain, as there are still several gaps before we reach a fairly certain point in the establishment of the New Empire. In this connection may be mentioned another volume, *Diospolis Parva*, by Mr. Petrie, which contains a very carefully worked out system for dating prehistoric finds by a series of types of pottery, arranged according to evidence afforded by several thousand graves, opened at various points in Egypt. The sequences are numbered from 30 to 80, in order to leave room for additions, as it was then assumed that some 300 years separated 80 from the First Dynasty, though it is clear that no such gap existed, and some authorities are even inclined to place 75 in the reign of Menes. In spite of the reckless plundering of Abydos for centuries, many small objects of great interest have been found, including an extremely beautiful set of jewelry, in gold, turquoise, lapis-lazuli, and amethyst. Especially noteworthy is a bracelet of representations of the royal hawk in gold and turquoise alternately. To the north of Abydos, Mr. Garstang excavated

some early cemeteries for the Egyptian Research Account, but without striking results until a large structure at Bêt Khallâf was reached, where two large tombs were cleared. They proved to belong to Neter-Khet, already known as builder of a pyramid at Sakkara, and Hen-Nekht, previously unknown, but evidently a successor of the foregoing, both kings of the almost unknown Third Dynasty. Neter-Khet seems to have succeeded Perabsen, who closed the Second Dynasty. Near by were the tombs of high officials of these kings.

With the support of Mrs. Hearst, an expedition under the charge of Dr. Reisner has been conducting scientific excavations for the University of California at several sites, which have already yielded a large mass of small objects of all epochs, including many stone vessels and early cylinders, and a very remarkable collection of gold jewelry. The records of the expedition include a valuable series of photographs of almost every grave opened, furnishing important evidence on the subject of archaic methods of burial, among which it may be noted that dissection of the body, at one time regarded as common, is almost unknown. In every case but one the separation of the head from the body was accompanied by evidence of previous robbery of the grave. At Abusir the German excavators have continued the clearance of the interesting temple of the sun-god, Ra, built in the Fifth Dynasty, and of which the chief feature seems to have been a great obelisk, surrounded by courts and chapels. Near the inclosure was found a great boat, some ninety feet long, built of clay and wood, undoubtedly one of the "sun-vessels," in which the god voyaged through the lower world at night. At Abu-Roash, Chassinat has proved that the stone pyramid on the plateau in front of the village was built by King Didoufri, the successor of Cheops, of the Fourth Dynasty, and has found a number of fragments of sculpture, including a fine head of this little-known monarch.

For the Græco-Roman period the most important results are likely to come from the excavations at Alexandria, conducted by a German expedition under the direction of Professor Schreiber. A part of the work consists in an endeavor to recover the plan of the most important parts of the ancient city by sinking trial shafts and often driving tunnels to determine the direction of streets or walls. Of the results obtained no detailed account has been published, but they are said to be satisfactory. In connection with this work, the Messrs. Thiersch, father and son, are occupied with the study of the remains of the famous temple of Serapis, and are reported to have made good progress in the history of the building, though with much damage to previously accepted views. Not very far from "Pompey's Pillar," quarrymen accidentally discovered a necropolis of the second century of our era, built in four stories, of which, however, only the second and third have been cleared. From an artistic point of view the paintings and reliefs in this tomb and in a similar one in another part of the city are of the highest importance for the history of the later Alexandrian art. Grenfell and Hunt continued their persistent search for papyri, especially those of the Ptolemaic period, in the Fayûm, but with less success than usual; for though many cemeteries were examined, there was but limited use of papyrus in preparing the coffins and where it was used, the moist soil had in most cases caused its decay. Near the end of the season, however, they were rewarded by obtaining a large quantity of mummy cases in which Greek and demotic papyri had been employed. The number of publications of papyri, literary and non-literary, increases with every year, and scholars rejoice over the recovery of tantalizing fragments from lost works of classical literature, or over the letters, decrees, and government documents which give such a vivid picture of the village life under Greek and Roman rule. The past year has been no exception to this rule, but none of the publications are of great general interest.

IV. Asia Minor.—The report of the second campaign of the Berlin Museum at Miletus shows a rapid advance in the recovery of the ancient city, though as yet the discoveries of sculpture and other works of art are not very striking. Further excavations at the "theatre" showed that this building was the Senate-house (Bouleuterion). In front of the building was a court containing an altar, and bearing on its walls a number of important inscriptions, chiefly of Roman times. Here, too, was a round base with an inscription in honor of the general Lichas, which mentioned the building of the Senate-house at this point. The building seems to have been erected about 200 B.C. Excavations at the so-called "Lion Bay" brought to light the city end of the aqueduct from the southern mountains, and a series of halls and porticoes, which are compared with the Piazza at Venice. The exact nature of these buildings, whether Agora or Emporium, is not yet clear. The Hellenistic wall and a late fortification were also examined, and in the latter were found a mass of earlier material, including the torsos of archaic statues and many architectural fragments, which seem to point to an important temple of Artemis in the neighborhood. The ancient system of drainage and the plan of the streets was partially traced, leading to the discovery of many foundations of Hellenistic times, and a number of Roman mosaic floors, one of which contains pictures of the nine Muses, with their

names of the Hesiodic order. Excavations were also begun at a hitherto unknown Heroön, about half-way between Miletus and Didyma, but had not reached any satisfactory result when they were suspended for the season.

At Pergamon, the German Archæological Institute has continued the excavations, begun during the autumn of 1900. Thus far an important gate of the city of Eumenes has been fully cleared, and the main street, leading up the hill from this point, followed in its zig-zag course until a second Agora of the time of the kings was discovered, which is now to be thoroughly examined. A fine head in the type of Alexander the Great and a long inscription with regulations regarding streets, drains, fountains, etc., are among the most important of the lesser discoveries. It is already clear that in spite of all that has been done, the city of Pergamon is very far from being an exhausted site. In this connection may be noted the opening of the Pergamon Museum at Berlin, which has been built primarily for the proper exhibition of the reliefs of the great altar. This has been set up in the centre of the building in as nearly as possible its old position. The Ionic colonnade which crowned the structure has been replaced only on the western side, where the flight of steps led to the platform on which the altar proper rose. The interior of the court formed by the altar has been used to display the single statues and other works of art, including the colossal marble copy of the Athena Parthenos of Phidias, which was found in the ruins of the library.

During the summer of 1900 the brothers Körte carried on excavations near Pebi in Phrygia, where it was suspected the ancient Gordion had stood. The work was very difficult, and the results somewhat scanty, though of value as bringing to light the only known remains of early Phrygian buildings, not tombs. In the city the pottery seemed to indicate a continuous occupation of the site from c. 1500 B.C. to the Roman period, though of the tumuli opened only one was certainly older than the seventh century B.C. The pottery showed that from the sixth century B.C., Greek trade flourished, and many fragments of Corinthian and early Attic ware, as well as of the later classes of Greek pottery, were found. A series of terra-cotta reliefs, which had decorated the brick wall of an early temple, threw an interesting light on the rock-cut façades of the Phrygian tombs. No inscription proved that the site was Gordion; but the general character of the discoveries, when taken in connection with the literary evidence, confirms the theory that this is the site of the ancient Phrygian capital.

Important results are also reported from an exploring tour of Dr. Belck in Pontus and Cappadocia. His first centre was Amasia, an impregnable fortress of antiquity, where he found a new Greek inscription of Pharnaces, son of Mithridates, and his first work was the examination of the neighboring districts, including Comana Pontica and Cabira, the treasury of Mithridates. He then marched south and passed through the hill of Uyuk, where he found new Hittite monuments and decided that the entire hill is artificial, covering probably the ruins of a temple which he assigns to the period between 2000 and 1500 B.C. His next pause was at the celebrated Boghaz-Keni, where the rock sculptures were carefully studied, and part of a badly damaged Hittite inscription copied. Belck refuses to admit that the neighboring ruins are those of the ancient Pteria. He considers that the city is of Turanian origin, and was destroyed c. 700 B.C. Here were found many clay tablets with Assyrian cuneiform writing. Cæsarea in Cappadocia was then made the headquarters, and the Troglodyte region to the west visited. Belck is convinced that in Cappadocia a great Cimmerian kingdom existed from c. 700-585 B.C., which had destroyed the Hittite states, and itself fell before Cyaxares. The Moschi, who are declared to be ancestors of the modern Georgians, occupied the region between 750 and 680 B.C., when they were driven out by the Cimmerians. To them are due the mysterious "Cappadocian" cuneiform tablets, whose source Belck has discovered in a ruined temple not far from Cæsarea. The longest known Hittite inscription covers four sides of a stele, and the remainder of an inscription is engraved on the body of a statue, of which the beginning on the head of the statue is at Constantinople. The expedition was to continue its work as long as the weather permitted.

V. Crete.—As in 1900, so during the past year, this island has been the centre of interest for all classical archæologists, for the work already done has shown that only the beginnings have been made, and that here is concealed an unsuspected wealth of material calculated to throw new light on the difficult problems of early civilization in the Mediterranean. At Knossos Mr. Arthur J. Evans continued his excavations in behalf of the Cretan Exploration Fund. It was soon found that the first season's work had only uncovered a part of the western side of the palace, and that the building was far larger than had been supposed. The absence of a plan makes a detailed description impossible, but it may be said that the western area has been further excavated, bringing to light more magazines, some of them full of great earthenware jars. To the north another quarter of the building was found, in which was a large bath, reached by a descending flight of steps. The most im-

portant discovery was to the east of the great court, where another series of rooms, believed by the discoverers to be the state chambers, came to light shortly before the cessation of work. At one point the walls were found to descend much deeper than elsewhere, and soon a triple staircase was revealed leading to a series of apartments, one of which seems to have had a double series of colonnades. Staircases, one above the other, were previously unknown in ancient remains, and the discovery shows an unsuspected development of architectural skill among the Mycænæan builders. In such extensive excavations small finds are naturally numerous, and many of them are of great beauty and interest. Intercourse with Egypt receives further proof in the presence of the cartouche of Khyan, one of the Hyksos kings, while more extended trade is suggested by a Babylonian cylinder of lapis-lazuli mounted in gold. The amusements of the court of Minos are indicated by a "draught-board" of ivory, plated with gold, and set with crystal on silver and blue enamel, and a set of fishes of bone engraved with various symbols, apparently also belonging to some game. New fragments of wall-paintings were found, among others a series showing girls taking part in the dangerous but favorite Mycænæan sport of bull-hunting. Further fragments of painted stucco reliefs show portions of human figures modeled with close attention to details in the rendering of muscles and veins and yet with a power unattained in the early days of later Greek art. Beneath this palace were found remains of a large settlement of the later Stone Age, which yielded a number of stone axes and primitive "idols" of earlier types than those hitherto found on Greek sites. Mr. Evans believes that this settlement can scarcely be later than 3000 B.C. The fund has also contributed to excavations undertaken by Mr. D. G. Hogarth at Zakro, in the extreme east of the island, where a Mycænæan trading-post seems to have been found. There are no remains of fortifications or of a palace, but the basements of a number of houses were cleared, yielding many specimens of good pottery and bronzes, and a mass of impressions in clay of signets, containing over 150 types. It is said that exploration shows clearly that in eastern Crete the indigenous Eteocretans occupied the heights inland, while the "Mycænæans" settled at favorable harbors or on fertile spots near the coast where there was an opportunity for profitable trade. The director of the British School at Athens, Mr. R. C. Bosanquet, also excavated under the auspices of the Fund, at Præsos, the ancient capital of the Eteocretans, in the hope that this too might prove a Mycænæan centre. This proved an error, at least so far as the site of the city was concerned, though some scanty remains of the early period were found in the neighborhood. The results of the campaign were, however, by no means unimportant for the later period of Cretan civilization, when the place seems to have been an important centre. An inscription containing seventeen lines of an unknown language in Greek characters was found, and a large number of terra-cottas, which point to the existence of a local school of art. The chief prize was the head and shoulders of a youthful male statue, though a shrine near the town yielded terra-cotta statuettes of a goddess in a new type. At Petras, near the modern Sitia, were remains of a fortified Mycænæan settlement, a type new in Crete, but the site has been so damaged by the construction of terraces, that only small results were obtained. Next to the discoveries at Knossos, perhaps the most important results have been obtained by the Italians, Professor Halbherr and Mr. Pernier, at Phæstos, where another great palace has been partially excavated. The work has been in progress for two seasons, and much still remains to be done. On the surface were found Byzantine tombs, then Roman walls came to light, and then remains of a Greek city; below this were unimportant traces of an earlier Greek city and also remains of the period between the destruction of the palace and the Greek settlement. The Mycænæan palace occupies the lowest summit of the hill, and this position has given rise to a somewhat complicated plan, with many corridors and staircases. The stonework is careful, but as yet there is no evidence of the elaborate decorations which form so marked a feature at Knossos. Of interest is a court with, at one end, a broad set of steps, which lead nowhere and can only have served as seats. The great hall or Megaron is reached by a flight of twelve steps, about forty-five feet broad, and contained a transverse of three columns which supported the roof; side staircases afford easy communication with other parts of the palace, including a room which the discoverers with no little probability regard as the women's apartment. The smaller finds are somewhat scanty, and there seems little doubt that the place was thoroughly plundered.

America also has taken part in the work of exploration. Miss H. A. Boyd, who with Miss Patten excavated the post-Mycænæan (geometric) houses and tombs on the heights of Kavousi in 1900, returned with Miss B. E. Wheeler in 1901 under the auspices of the American Exploration Society of Philadelphia, to make further search for Mycænæan remains. Aided by some intelligent peasants of a neighboring village, she was so fortunate as to find on the low hill of Gournia "the most perfect example yet discovered of a small Mycænæan town." It is approached from the sea by a paved road, which divides at the foot of the hill, to unite again at the small

palace of the ruler. The interest of the site is largely in the well-preserved streets and private houses, often at least two stories high, of which twelve have been completely cleared. A special road leads to the only complete Mycæan sanctuary yet discovered, a small quadrangular building, in which were found vases and terra-cotta figures. The town was unfortified and seems to have been plundered and burned; but the ravagers were not very thorough in their search, for the houses contained many unbroken vases and a notable collection of bronze utensils and ornaments, including a saw nearly eighteen inches long.

VI. Greece.—The great discoveries in Crete and the important excavations in Asia Minor have drawn attention from Greece, although the progress of archæological discovery in that country has gone steadily on. The chief centres of excavation have been Ægina, Corinth, Delphi, and Tegea. On Ægina Professor Furtwängler has carefully explored the site of the so-called Temple of Athena, where Cockerell and his companions discovered in 1811 the pediment statues which, restored by Thorwaldsen, now adorn the Glyptothek in Munich. The expedition was sent by the Bavarian government in the hope that more careful search might yield more fragments throwing further light on the perplexing restorations and grouping of these sculptures. The results have been most gratifying. It is true that only two heads, which certainly belonged to the pediments, have been found, though it is possible that five others ought to be included, while the other fragments of these groups were not of very great importance. The scientific interest lies rather in the thorough clearing of the entire site of the temple, thereby bringing to view on the floor of the temple itself the marks which showed the position of the cult statue, and the holes for the posts of the railing which kept visitors at a proper distance, while in the sacred precinct were found the propylon and great altar, as well as other buildings of uncertain use, one of which contained an old Greek bath with three tubs. The smaller finds, terra-cottas, vases, etc., showed that the site had been occupied from the Mycæan period down to the fourth century, but in Hellenistic and Roman times it must have been almost deserted. The present temple was the fourth, and though the foundations of the earlier buildings were not found—the present structure is too solid to permit of search beneath it—architectural fragments were numerous, and many of them finely preserved and with brilliant coloring. The name of the temple was also fixed by the discovery of an archaic inscription in the Doric dialect, seemingly of the sixth century, recording the building of the house for *Aphaia*, the erection of the altar and the ivory (i.e. the wood and ivory cult-statue), and the construction of a wall about the sacred precinct. The age of the inscription and the place of its discovery alike render it certain that it does not refer to the present structure, but there can be little doubt that it is the official record of the earlier temple. Of this goddess we know but little. She was identified, according to Pausanias, with the Cretan Britomartis and Dictynna, and like them was later connected with Artemis. Early terra-cottas show her with a child in her arms, and it seems clear that she was one of the goddesses who brought help to women in all their needs, and guarded the growth of children. Many of the small objects recall those from the sanctuary of Aphrodite at Naucratis, a place where Æginetans were prominent, while others recall the oldest finds from the Artemision at Ephesus. Though the site of the temple has been finally cleared, further exploration of the island is planned, which it is hoped may lead to the discovery of the celebrated shrine of Damia and Auxesia, whose legend is told by Herodotus. An inscription, probably of the later fifth century, containing an inventory of the contents of this temple has been found, from which it appears that Herodotus was justified in his statement that the women of Ægina dedicated the long pins which secured their garments, to these goddesses, whose local names, however, were Mnia and Auzesia. Furtwängler states that all the discoveries confirm the date already assigned by him to the temple sculptures, and suggests that the building was erected as a thank-offering for the victory of Salamis, and that the ode of Pindar to Aphaia was written for its dedication.

At Corinth the American School at Athens continued the clearing of the ground to the west of the old fountain in the agora, finding remains of a series of vaulted rooms, which seems to have lined the south side of the hill on which the old temple stands, and probably had a colonnade along the front. Lesser excavations were made at Pirene, where a large basin was discovered beneath the later circular basin in the open air, and on the summit of Acro-Corinth, in an unsuccessful attempt to discover the famous temple of Aphrodite. West and south of the fountain Glaucæ attempts were made to find the Odeum and tomb of Medea's children; foundations of houses and a large platform of *opus incertum*, the latter covering early Greek walls, were found, but not the buildings sought. The year has, therefore, been a somewhat barren one in this field, but the temple hill may well be expected to yield good results when the Roman buildings have been cleared. The Greek government and the foreign archæologists regard the work as of great im-

portance, but the technical difficulties are great, and the work has been hampered by lack of sufficient funds to employ an adequate force.

At Delphi the French conducted what is probably the last campaign in their ten years' excavation. This season's work was devoted to clearing a site on the road from Arachova which was believed to have been occupied by the temple of Athena Pronoia. The result was the discovery of a narrow terrace over 100 metres long, surrounded by strong walls, with at least three gates, and containing six temples or chapels, two altars, and a dwelling for priests. At each end was a temple, one of porous stone, which seems to have been in ruins when Pausanias visited the place, the other of local limestone, seems to be the temple of Athena. There was also a small building, probably the Phocian treasury, built in the sixth century and decorated with sculptures in the best Ionic style, the whole much resembling the Treasury of Cnidus. The Tholos, or round building, a famous work, was far richer than those at Epidaurus and Olympia. In its Doric capitals it recalls the Parthenon, while the badly damaged fragments of sculpture recall those of the Mausoleum, and seem likely to play an important part in the history of early fourth century art. The sculptures found in these excavations are of especial importance as work of the fifth and fourth centuries has been but sparsely represented, most of the art of Delphi belonging to the archaic period. At Tegea the French have begun the excavation of the great temple of Athena Alea, and have already found more fragments of the pediment sculptures, including a head of Heracles, as well as beautiful architectural remains and a female head, which seems to be of the school of Scopas. Of the many surprises which have occurred in recent years in the field of classical archæology, few have awakened greater interest than the recovery from the sea of a cargo of statues and other works of art which were lost off Cape Malea near the island of Cythera, the modern Cerigo. It is known from Lucian that a ship of Sulla's, laden with works of art sent as spoil to Rome, was sunk off Cape Malea, and it is noteworthy that thus far no piece recovered can be assigned to a date later than the first century B.C. It should be added that some observers consider most of the works only copies made for sale. The first news came from sponge-divers, but the Greek government at once sent two ships with expert divers to the spot, and the end of the search is not yet reported. The statues and bronzes were naturally packed in the hold, and are said to form a mass over four metres deep, the bronzes of course on top. Unfortunately the marbles are for the most part so badly corroded by the action of the salt water, that only the merest outlines are recognizable. There is, however, one fine marble statue of a crouching boy, with the left arm raised and the right hanging at his side, which seems to belong to a realistic school of the Hellenistic times. Many of the bronzes are in a fair state of preservation, though often shattered. The gem of the collection is a fine statue of a youth, probably Hermes, somewhat more than life-size, which was found broken in many pieces, but with the beautiful head uninjured. It is said to stand to other bronzes as the Hermes of Praxiteles to marbles, and to be a worthy rival of the Olympian figure. It is said that the fragments can be pieced together, and that Herr Sturm, who successfully restored the bronzes from Ephesus, would undertake the task, provided he were allowed to take the fragments to Vienna, where were the necessary appliances. Among the smaller objects are numerous amphoræ and coarser earthenware vessels from the ship's stores, and also a number of glass bowls and vases, often of great delicacy and beauty in design and decoration, many of which the skill of the divers has succeeded in bringing to the surface uninjured. Many sites in Greece have been the scene of lesser excavations, which have yielded valuable information, but little of general interest.

VII. Italy.—As usual, the past year has seen many small excavations and chance discoveries in various parts of the peninsula, which have brought to notice many isolated facts of interest for Roman art and history. Prehistoric cemeteries have been searched and more information gained on those changes in burial customs which often afford a clue to the migrations of races in Italy. Sicily and Sardinia seem to have been the chief field for these explorations, and the choice of the latter is especially welcome, as opening up a region hitherto but little known. Already a cemetery of the neolithic and eneolithic times has been found with pottery such as characterizes this period in Sicily and on the mainland. At Nora remains of the Punic or Phœnician settlement have been discovered, together with later Roman walls and a necropolis of the second and third centuries of our era. At Pompeii the work of clearing the town goes steadily on, but no remarkably rich houses seem to have been reached during the year. Of interest is the publication of the remarkably beautiful and perfect statue found in November, 1900. It is bronze and attributed to the last years of the fifth century B.C., as the work of an artist who modified the Polycleitan type under Attic influence, but shortly before the destruction of the city was covered with a thin coating of silver and the right hand altered to fit it for use as a lamp-holder.

Rome still continues the centre of archæological interest, though the excavations about the Forum have furnished no startling sensations. The chief work has been done in connection with the removal of the church of S. Maria Liberatrice and the exploration of the venerable church of S. Maria Antiqua, which was thus brought to light. This church contained a number of interesting frescoes, some of which may be dated in the sixth century, and all of which are being carefully copied in full size, while the interior is to be protected by a permanent roof. Many graves have been found under the pavement of the church, and also a large piscina, which seems to have belonged to the imperial palace of the first century of our era, as it was partially destroyed by the building of the Augusteum. Boni believes that he has uncovered the foundations of the Arch of Tiberius in the Forum not far from the platform which he considers the rostra of Julius Cæsar, and Lanciani has proposed to identify with the ancient Volcanal, an altar of which remains can be traced on a rocky ledge at the foot of the steps of the Temple of Concord, and therefore close to the Comitium. Especial mention should be made in this connection of the valuable work of Otto Richter, *Die Topographie der Stadt Rom* (2d edition, Munich, 1901), which in an appendix gives an account of the excavations in the Forum since 1899, and is provided with valuable plans and illustrations. Of much interest to students of art is the purchase by the Italian government of the Ludovisi gallery of ancient sculpture, and the Borghese Villa, sculpture and paintings. The villa is to be preserved as a museum for the exhibition of the Borghese collections, and it is probable that the Ludovisi sculptures and the Corsini paintings will also be exhibited here, though without loss of their identity. The Ludovisi collection, though small, contains the famous seated Ares, probably the copy of a work of Scopas, the group of the Gaul and his wife, the colossal head of Hera, the group by Menelaus, and other works of importance in the history of ancient art. The municipality of Rome has also been presented by G. Barracco with his valuable collection of ancient marbles, but only on condition that it should not be placed in either of the museums of the Capitol. As a result a new building is to be erected on the Corso Vittorio Emanuele.

ARCHÆOLOGY, AMERICAN. During colonial days, studious pioneers were impressed by certain similarities between the customs of the American aborigines and those recorded in the earliest literature of the region about the eastern shores of the Mediterranean; and various suggestions were made as to former connection between the historical peoples of the East and the tribes of the New World—a conspicuous hypothesis being that connecting the American tribesmen with the "ten lost tribes of Israel." The various suggestions served to stimulate systematic study of the Amerind (or native American) tribes; some of the most extended records of observation on the customs of the native tribes (e. g., that of Lawson, 1708-1709) were inspired by the desire to prove connection between the Israelites, or other eastern peoples, and the western natives; and the influence of these studies extended widely and did much toward preparing the way for such systematic investigations as those of Gallatin, Morgan, Hale, Brinton, and other eminent American ethnologists. Throughout this early period, American archæology comprised little more than discussion of the origin and migrations of the red race discovered by Columbus; and the discussion was speculative rather than observational. As settlement extended beyond the Alleghanies and over the interior plains, attention was caught by the ancient mounds and other earthworks, especially in the valley of the Ohio and along the Mississippi bluffs and forelands; and the notion grew up that these great works were monuments to a people or race earlier than the aborigines found in the same region by the pioneers. The hypothesis proved peculiarly attractive, taking strong root in the minds of the settlers and spreading throughout the literature of this and other countries, the supposed ancient race being designated "Mound-builders." Like other firmly held ideas, this prevailing notion stimulated inquiry, and did much to attract attention toward prehistoric artifacts entombed in the mounds scattered over the surface and buried in separate graves. It was during this period that the scientific archæology of America began to assume definite form and purpose, and as speculation grew into actual investigation (after the normal fashion of increasing knowledge) important contributions to the young science were made by Squier and Davis in the Ohio valley, Lapham in Wisconsin, and other students. As the mound research progressed, the observers became more and more impressed with the similarities between the artifacts in even the most elaborate mounds and those employed by surviving tribes; and the idea steadily grew that, after all, the builders of the mounds were none other than the tribesmen whose lineal descendants still lived in the mound region. Naturally the comparisons of ancient and modern artifacts stimulated observation among the living aborigines, and hastened the development of a distinctively American ethnology, already assuming shape through investigations to which statesmen and other publicists were naturally led in their efforts to deal justly and peacefully with the aboriginal land-

owners. Thus the third stage in the development of American archæology was that in which the science became definitely observational, and in which it came to be recognized that the Amerind tribes and culture may best be regarded as essentially indigenous. True, suggestions of extraneous origin for people and culture have been raised and tested at every stage of progress; suggestions of affiliation with, or descent from, the Israelites of old, the Hittites, the early Egyptians, the ancient Phœnicians, as well as the Japanese and Chinese and Polynesians of the West, are indeed always with us; but the body of American archæologists have become satisfied to deal with the prehistoric relics of the western hemisphere as products of a single people ranging from the Eskimo of the North to the Fuegians of the South, or the direct ancestors of the same great people. Thus the field of American archæology is at once narrowed and rendered definite, and the investigators in this field have acquired the confidence of direct contact with phenomena, and have formulated classifications and principles which give promise of wide applicability as they are extended to other fields.

Definitions.—During the opening year of the new century the method of classifying artifacts in terms reducible to stages in intellectual development has been pursued with advantage. Thus, Holmes has reviewed his earlier studies of pottery, and especially of the symbolic designs impressed or painted on aboriginal fictile ware, and has made great progress in interpreting or identifying the symbolic designs, so that his monograph (still in the press) affords a means of classifying the tribes of eastern United States by intellectual status, and at the same time of correlating the stages of æsthetic progress with those of industrial, social, and fiducial development. Of similar import are the results reached by Fewkes in his studies of prehistoric fictile ware from the Pueblo region, and both lines of inquiry connect themselves instructively with the investigations of basketry conducted by Mason in the National Museum, and Dixon in the American Museum of Natural History. Of related import, too, are the results of Dorsey's work on collections of both prehistoric and recent material from several localities; while Culin, through a study of games and gaming implements among living tribes, has been able, in the first place, to interpret many puzzling artifacts from various prehistoric sites, and, in the second place, to outline the course of development of primitive thought along certain previously obscure lines. On the whole, the work of the year has tended to establish the classifications of peoples and their products according to a system of intellectual development. In this system the great stages are defined as (1) zoomimic, (2) protolithic, (3) technolithic, and (4) metallurgic; and while the basis for this arrangement is primarily industrial, it is found easily reducible to æsthetic, social, or fiducial bases; indeed, the chief strength of the classification in terms of intellectual development is found in the fact that it harmonizes the various line of activital growth.

Instrumentalities.—A number of powerful institutions have continued work in American archæology, either directly or indirectly. The Bureau of American Ethnology, under the Smithsonian Institution, maintained a party under Russell in archæologic reconnaissances, chiefly in Arizona, throughout the greater part of the year, and employed other parties in different districts for shorter periods; Dr. Fewkes made extended reconnaissances in portions of New Mexico and Chihuahua, (Mexico), not hitherto adequately examined; McGee conducted local investigations in Colorado; Swanton obtained material of archæologic interest in British Columbia; Stein studied the distribution of ancient and modern settlements in northern Greenland and Ellesmereland; and Mooney collected certain prehistoric material in connection with that of modern times in Oklahoma and Indian Territory. The National Museum, also under the Smithsonian Institution, continued the accumulation and study of prehistoric material from various districts; in addition, Hough made an extended survey and large collections in the Pueblo region, while Holmes, with Gill (of the Bureau of American Ethnology), made researches and collections of remarkable interest in Indian Territory. The work of the American Museum of Natural History (New York) was prosecuted with vigor and yielded important results, the researches of Saville in Mexico being especially noteworthy, and those of Pepper in the Pueblo region hardly less so. The Peabody Museum of Archæology and Ethnology (Cambridge) rendered excellent service to the science in both field and office, and the Museum of Archæology and Palæontology of the University of Pennsylvania (Philadelphia) made notable collections, largely through the personal efforts of Culin; while the rich material from other countries, added during the year, gave opportunity for comparative studies of great utility. The Carnegie Museum (Pittsburg) maintained steady growth, some of the additions made during the year by Hatcher being especially noteworthy. The Field Columbian Museum (Chicago) maintained energetic activity; the department of anthropology, under Dorsey, extending especially successful operations into the Pueblo region, the region of the plains, and other districts. The Golden Gate Park Museum (San Francisco)

continued the acquisition of instructive material both prehistoric and recent; while the University of California, aided by the munificence of Mrs. Phœbe A. Hearst, began archæological and ethnologic investigations of great promise. The work of the Museo Nacional de Mexico and that of the Archæological Museum of Ontario (Toronto, Canada) was continued, the researches of Leon in connection with the former and those of Boyle in the latter being noteworthy. Various individuals conducted important archæological investigations more or less independently of the institutions; Moore, of Philadelphia, Phillips, of Chicago, Thurston, of Nashville, and Moorehead, of New York, deserving especial notice. The voluntary associations serving to coordinate and guide archæologic inquiry include the Archæologic Institute of America (which is, however, devoted chiefly to Oriental and classic archeology), the Anthropological Society of Washington, the Ethnological Society of New York, and the Section of Anthropology of the American Association for the Advancement of Science; while a movement toward the formation of an anthropologic association of national character, which will doubtless foster archæologic work, was started just before the close of the year. The principal media for publication of material pertaining to archæology are, the *Annual Reports* of the Bureau of American Ethnology; the *Annual Reports* of the Smithsonian Institution and National Museum; the *Memoirs and Bulletins* of the American Museum of Natural History; the *Memoirs and Reports* of the Peabody Museum; together with the series of publications maintained by the Field Columbian Museum, the Museum of Archæology and Palæontology, and other institutions noted above. The independent periodicals comprise the *American Anthropologist*, New York, the *American Antiquarian*, Chicago, the *Proceedings* of the American Association for the Advancement of Science, Washington, and *Records of the Past*, Washington.

Notable Events.—By far the most striking event in American archæology during the year 1901 was the discovery of human relics associated with remains of extinct animals in a spring near Afton, Indian Territory. The discovery was made early in the year by Dr. R. H. Harper, of Afton, and was communicated to the Bureau of American Ethnology; and after correspondence concerning details, Professor W. H. Holmes, of the National Museum, and Mr. DeLancey Gill, of the Bureau, were commissioned to conduct an investigation on the ground. On visiting the locality in October, they made extensive excavations, revealing the geologic structure and the relations of both human relics and the animal remains to the spring in which they were originally discovered. The spring flows from a marshy depression lined with alluvium or muck of indefinite age, though of course largely modern. Beneath the alluvium lies a considerable deposit of stratified sand and gravel, throughout which are distributed bones and teeth of elephant, mammoth, sloth, native horse, etc.; the age of this deposit is indicated by the fossils to be late Neocene (Pliocene) or early Pleistocene, and while the observations were not sufficiently extended to permit physical correlation, the probabilities point toward the Columbia formation of early Pleistocene age. Naturally the first presumption was that of contemporaneity of the men who made the artifacts with the animals whose remains were entombed; and the presumption was strengthened by the finding of bones and teeth of buffalo, elk, deer, and modern (European) horse, associated with the implements in the spring. As the excavations were extended it was found, however, that the human relics and remains of recent animals were confined to the immediate vicinity of the spring and the alluvium, while the ancient remains were distributed throughout the undisturbed strata beneath the alluvium; accordingly it became evident that the case was one of juxtaposition rather than association, and that the juxtaposition afforded no evidence of contemporaneity of man and the extinct animals. In seeking to explain the occurrence of objects pertaining to two distinct geologic periods, the investigators profited by the experience of workers among living tribes, and were led to interpret the spring as a sacred place, or shrine, at which native devotees made sacrifice. In view of the habitual workings of the primitive mind, it was easy to see that the chalybeate and sulphur-bearing water of the spring, no less than the presence of the gigantic teeth and bones, would naturally inspire awe in the minds of aboriginal visitors, and prepare the way for shamanistic observances; while it would quite accord with primitive habits for the shamans and hunters to make the place one of sacrifice, and to cast into the spring portions of the buffalo and other animals taken in the chase, quarters or entire bodies of trained buffalo-horses sacrificed as invocations for future success, and the finest implements and trappings made for, or used in, the local industry of buffalo hunting; it would also be in accord with primitive philosophy for the mystery-loving tribesmen to bring giant teeth and bones found elsewhere for sacrifice at the same shrine. Thus, through acquaintance with the habits and ideas of primitive men, the investigators were able to explain satisfactorily a most striking and peculiar juxtaposition of modern relics and ancient remains, and so to solve what would otherwise be a puzzling problem in archæology; indeed, there have been many cases

in which related juxtapositions have remained to haunt the literature of the science for generations. It is, perhaps fortunate that after the field investigation was complete, and indeed after the results were announced before the Anthropological Society of Washington, correspondence brought out the fact that an aged Osage chief still living in another part of the territory retains some memory and distinct traditions of the identical spring as a place of sacrifice for success in hunting from time immemorial. The collections made at the spring were no less remarkable in number and character than in the peculiar juxtaposition; the collection of elephant teeth is the largest thus far made in a single locality in America. The mastodon teeth also form the largest collection thus far made at a single locality, and include two species; while the chipped implements of novaculite or related material are superb in size and finish, and form the finest known collection from a single American locality.

Another event of note (albeit only secondarily archæologic) was the definite establishment of a department of anthropology in the University of California at the instance, and through the munificence, of Mrs. Phœbe A. Hearst, Dr. A. L. Kroeber, with two or three collaborators, was placed in charge of the work; and there are several advisory collaborators, including Professor F. W. Putnam, of Harvard, Madame Zelia Nuttall, and Miss Alice C. Fletcher, of Washington. The work contemplated is both ethnologic and archæologic, the former directed especially toward the surviving California tribes and the latter toward the collection and interpretation of prehistoric material in the same region. Still another event grew out of a meeting of the American Association for the Advancement of Science in Denver, in August; after the close of the meeting a number of members of the anthropologic section made an excursion through the region of cliff dwellings in southern Colorado and northern New Mexico. The excursion was arranged by officers of the Cliff Dwellings Association, Mrs. Virginia C. McClurg, of Colorado Springs, Mrs. W. S. Peabody, of Denver, and Mrs. John Hays Hammond, being especially active. The participants in the excursion were much impressed with the desirability of taking steps toward the preservation of the interesting ruins of the region; and among the results of the excursion may be counted several bills introduced in the national Congress toward the close of the year by Honorable John E. Shafroth, Honorable John C. Bell, and others, designed to secure the protection of these antiquities from vandalism.

Noteworthy Publications.—An important memoir issued by the American Museum of Natural History early in the year was *Cairns of British Columbia and Washington*, by Harlan I. Smith and Gerard Fowke; the paper comprising a portion of the results of the Jesup expeditions to the northern shores of the Pacific. Other memoirs of the same series issued during 1901 are of archæologic interest, notably *Kwakiutl Texts*, by Franz Boas and George Hunt, and *Traditions of the Quinault Indians*, by Livingston Farrand, both of which open the door to aboriginal thought, and hence to the habits and customs of prehistoric times. The Peabody Museum issued an important memoir on the antiquities of the southern portion of North America, under the title *Researches in the Central Portion of the Usumatsintla Valley*, by Teobert Maler, and also a special publication touching on Mexican and other antiquities of the western hemisphere, entitled *Fundamental Principles of Old and New World Civilization*, by Zelia Nuttall. Early in the year the Bureau of American Ethnology published as a part of the eighteenth annual report, an elaborate memoir on *The Eskimo About Behring Strait*, by E. W. Nelson, containing incidental references to prehistoric material, while the motives expressed in the exceedingly numerous artifacts described mainly date back to the unwritten past. Later the nineteenth report appeared, with several archæologic memoirs; one of these, entitled *Mounds in Northern Honduras*, by Thomas Gann, describes in detail the antiquities of a little known region, including both tumuli and ruins of imposing structures; in *Mayan Calendar Systems*, by Cyrus Thomas, the calendric inscriptions of Yucatan are discussed at length and in part interpreted; while in *Primitive Numbers*, by W. J. McGee, and *Numerical Systems of Mexico and Central America*, by Dr. Thomas, as well as in *Tusayan Migration Traditions*, by J. Walter Fewkes, much use is made of prehistoric material as well as data derived from living aborigines. Publications of hardly less note have been made by the National Museum, the Field Columbian Museum, and other institutions in such number that the first year of the new century may justly be regarded as notable in the history of American archæology.

Studies of Artifacts.—While the current investigations have tended toward the formal establishment of the classification of stone artifacts as (1) zoomimic, (2) protolithic, and (3) technolithic, there has been little special work pertaining to the lines of human activity represented by the manufacture of stone. Holmes visited certain aboriginal quarry sites in southwestern Missouri, and also examined the site

from which Dr. Koch reported the association of stone implements with remains of extinct animals many years ago, and gained new data in both places. Phillips in Illinois, and Rust in California, continued investigating stone artifacts with success and good promise of early publication, while Moorehead collected material for revision of his work on *Prehistoric Implements*, 1899; and on the last day of the year, McGee presented before the Anthropologic Section of the American Association for the Advancement of Science, in Chicago, a communication on *The Beginning of Lithoculture*.

Human Antiquity.—The opening century has produced no new indications of high human antiquity on the western hemisphere. Putnam visited the Calaveras region during the autumn, and stimulated local observation in the auriferous gravels and other deposits, while Volk continued excavations in the late pleistocene gravels at Trenton; but neither locality has yielded noteworthy data during the year. So still, as during the last decade, the question of the antiquity of mankind in America remains open, with a presumption in favor of an origin running back toward, or possibly beyond, the beginning of the Pleistocene, but with scarce an indubitable fact indicating human existence on the western hemisphere before the latest ice invasion of the glacial period.

ARCHER, FREDERICK, musician, died at Pittsburg, Pa., October 22, 1901. He was born at Oxford, England, June 16, 1838, and studied music under his father, and also in London and Leipsic. Going to London he became an organist, and later was conductor of an orchestra and director of opera. In 1881 he removed to Brooklyn, N. Y., where he became organist of Plymouth church. In 1887 he conducted the Boston Oratorio Society; and from 1895 to 1898 was the conductor of the Pittsburg Orchestra, now under the direction of Victor Herbert. Among his compositions should be mentioned the *Adagio Maestoso*, *Fugue in D minor*, *Grand Fantasia in F*, for the organ, and the two texts, *The Organ*, and the *Collegiate Organ Tutor*. He was also the founder (1885) and editor of a musical weekly, *The Key Note*.

ARCHITECTURE. The chief architectural features of 1901 were undoubtedly the splendid buildings of the Pan-American Exposition (*q.v.*) at Buffalo. The influence of these structures upon architecture will doubtless be of real value, not only in the development of future expositions, but in the construction of industrial buildings both public and private. Architecture is also being fostered by many schools, clubs, and other organizations throughout the United States. The centennial of the Louisiana purchase has been taken as a fitting occasion for an international exposition at St. Louis (see LOUISIANA PURCHASE EXPOSITION). The unity, suitability, and magnificence of its architectural features are assured by the personnel of its board of architects, and the work of organization, designing, and draughting is in progress. A resolution introduced at the annual convention of the American Institute of Architects at Buffalo in 1901, after pointing out the importance of architectural improvements in towns and cities, and noting that municipal architecture had been the subject of a department exhibit at three international expositions abroad, appealed to the commissioners of the Louisiana Purchase Exposition for a similar exhibit at St. Louis. Among the buildings erected for the South Carolina Exposition (*q.v.*) at Charleston, the art building is the most artistic and impressive. It stands in a beautiful position, and has a large sculpture hall with two spacious and well-proportioned side galleries. Upon the suggestion of the art director, the thirteen exterior panels of the building were inscribed with the names of thirteen deceased American painters, sculptors, and architects instead of with the names of the old masters. The approved list was: Painters—Benjamin West, John S. Copley, Gilbert Stuart, Thomas Sully, George Inness, A. H. Wyant, Homer Martin, and George Fuller; sculptors—Crawford, Powers, and Story; architects—Richardson and Hunt.

Of national interest is the commission appointed to inquire into the enlargement of the White House, as is also the renewed proposal for a memorial bridge across the Potomac from Washington to Arlington. For continuing the examination of the bridge project, \$5,000 were appropriated in the sundry civil act of 1899. The first prize for design has been awarded to Mr. Edward Pearce Casey, with Mr. William H. Burr as chief engineer. Of greater national importance was the report of the Burnham Commission on the beautifying of Washington. The commission of three appointed to prepare the report visited Paris, London, Madrid, Rome, Vienna, Buda-Pesth, Munich, Berlin, The Hague, and Brussels, omitting St. Petersburg, because of lack of time. Berlin was considered artistically one of the first cities in the world. The report presented to Congress and the two models exhibited at the Corcoran Art Gallery in Washington in reality recommended the adoption of the celebrated plans prepared by L'Enfant under the supervision of Washington and Jefferson, with some modifications to adapt them to the altered and increased

needs of the capital of a nation of 70,000,000 people. The predominating ideas in the whole treatment are dignity and beauty. The plans call for systematic, continuous work carried through a considerable number of years, and reveal the contemplated construction of a number of handsome public buildings, and the laying out of gardens, parks, and avenues, all with an axial relation to the Capitol, White House, and Washington monument. The plans were prepared in pursuance of a senate resolution of March 8, 1901. The sub-committee of the district committee having the matter in charge met the representatives of the Institute of American Architects and agreed that Daniel H. Burnham, of Chicago, and Frederick Law Olmsted, jr., of Brookline, be employed as experts, with power to add to their number. These gentlemen accepted the task, and subsequently invited Charles F. McKim and Augustus St. Gaudens, of New York, to act with them in the preparation of plans. Charles Moore also rendered efficient service in cooperation with the commission. Congress is providing a reasonable scheme of taxation whereby the plans may be carried out without proving burdensome to the district.

Two new artistic structures in New York City are the Appellate Court House and the New York Yacht Club. An advance in domestic architecture is marked by the mansion at Roslyn, L. I., for Mrs. Clarence H. Mackay. The Tarsney act has exerted a beneficial influence upon government work, and carefully managed competitions now give results that exhibit a desire for better architecture. The Pennsylvania capitol competition resulted in the award falling to Mr. Huston. The treatment received by the profession, however, in this case, from the state commissioner, was the source of much adverse comment. The proposed buildings for Washington University, at St. Louis, Mo., are on a grand scale, and other noteworthy designs of 1901 are those of the Arkansas state capitol, the Indianapolis post office, the Newark court house, a court house at Fort Dodge, Ia., the Memorial Library for Washington and Jefferson College, Washington, Pa., and in New York the new Stock Exchange, the Union Club House, and the United States Customs House. The new cathedral of St. John the Divine, on Morningside Heights, New York, is slowly progressing; the monster lathe completed during 1901 for the dressing and polishing of the 32 huge monolithic columns of the choir, marks an epoch in the manufacture of machinery for architectural purposes. The demolition of the National Academy of Design building at the corner of Twenty-third Street and Fourth Avenue, N. Y., has occasioned some regret. This Venetian-Gothic building, with its conspicuous and variegated ornamentation of black and white, and its interesting history and associations, had during its quarter-century existence endeared it to American artists and citizens. The eight marble columns in the corridor of the old building have been removed for incorporation in the new and elaborate building to be erected at Amsterdam Avenue and One Hundred and Ninth Street, where the National Academy of Design has temporary quarters. The designs of the new building are by Carrère and Hastings, architects also of the New York Public Library, now in course of construction at Fifth Avenue and Forty-first and Forty-second streets. The sixteenth annual exhibition of the Architectural League of New York was held in February and March, 1901, and maintained the high standards of previous exhibitions.

Both in the United States and in Great Britain agitation continued in 1901 for the registration of architects. The need was emphasized in England by several actions for heavy damages, which brought home the liability of architects for inefficiency or negligence, and were useful as aiding to weed out the charlatans who impose themselves upon the public. An attempt was made to awaken the Royal Institute of Great Britain to a sense of its responsibilities by a resolution "to appoint a committee to inquire into the status of the architectural profession and to suggest remedies if needed." The resolution received particular prominence, following as it did on the action of the government authorities in the selection of successors to the deceased architects for the new offices in course of construction in Whitehall and Parliament Street, although in the selection of the son of one of the late architects, the British characteristic of hereditary transference was apparent.

Among the principal events in the architectural sphere of the United Kingdom of Great Britain and Ireland was the choice of an architect—restricted to five nominees—to elaborate the architectural appointments of the National Memorial to the late Queen Victoria (described under SCULPTURE), the work of Mr. Thomas Brock, R.A., the sculptor who was chosen by a sub-committee of the committee appointed by the King. The restriction and choice occasioned considerable caustic criticism on the score of favoritism. In ecclesiastical architecture the new cathedral for Liverpool, in connection with which one of Mr. Gladstone's last expressed wishes was that he would were he possessed of \$5,000,000 wherewith to endow the city with the cathedral, was also the occasion of serious controversy. St. James' Mount, the central site chosen, was generally approved; but when the committee in charge stated their preference for a particular phase of English Gothic, a controversy arose as to

whether Renaissance was not the more appropriate garb for a twentieth-century English cathedral. The committee eventually expressed a desire to consider other designs. The chairman, in replying at considerable length to critics of the cathedral scheme, gives assurance that if any genius can produce a great and magnificent twentieth-century cathedral, the committee will not select an adaptation of a thirteenth or fourteenth-century Gothic edifice.

The danger to St. Paul's cathedral by the tunneling for the underground railways occasioned considerable alarm, which has not been allayed by the optimistic reports and suggestions of the cathedral architect. The completed restoration of Lichfield cathedral, including the statuary and ornamental work destroyed by the Puritans, has renewed in this ancient edifice its essential characteristic of beauty. The restoration of the west front of Bath Abbey has also been completed. Auxiliary scaffolding in the restoration, now in progress, of Peterborough cathedral made possible a critical examination of the colossal statue of St. Peter, which, undisturbed, has overlooked the city for eight centuries. With the exception of the missing right hand it was in an excellent state of preservation. One of the most interesting items in the progressing restoration of Canterbury cathedral was the repolishing of two pink marble pillars which came from the ruins of ancient Carthage and were sent in 1176 by Pope Alexander III. to form part of Thomas à Becket's tomb, but were incorporated in Trinity chapel, where they now stand. The restoration of the Lady chapel of Winchester cathedral is interesting to Americans, as the funds for the purpose were obtained by the sale of a picture of Benjamin West's, which was removed from the great screen in 1900. The picture was sold to Mr. J. Pierpont Morgan for £1,500 and is now in New York. The external fabric of the Roman Catholic cathedral in Ashley Gardens, Westminster, is rapidly approaching completion, and the originality and beauty of the design can now be thoroughly appreciated. Designs for St. Anne's Roman Catholic cathedral at Leeds were accepted in 1901.

The architectural features of the Glasgow International Exhibition (*q. v.*) were of a utilitarian order, marked by an absence of original designs. Competitions throughout the United Kingdom ended in the selection of plans for a new borough asylum at Cardiff, municipal buildings at Hereford, a Blue Coat Hospital at Hereford, work-house infirmary for Stockport, police courts and fire station at Manchester, and police courts at Bristol. Numerous large buildings in course of construction include the Victoria and Albert museum at South Kensington, new municipal buildings at Cardiff, and a market hall at Leeds, while the building of apartment houses in London on American models is an evidence of the architectural trend of the period. Without competition the authorities of the University of Birmingham gave the commission for their new buildings to the architects who, in open competition, won the commission for the splendid law courts in that city. The Building Trades Exhibition at the Agricultural Hall, London, was conspicuously successful. The principal death recorded among the architects of the United States during 1901 was that of Napoleon Le Brun, New York, at the age of eighty. The obituary of the profession in Great Britain included such well-known names as Arthur Cates, James Brooks, John McKean Brydon (*q. v.*), John Burnet, Henry Yeoville Thomason, Charles John Innocent, William Bassett Smith, Frederick Boreham, and Charles Dorman.

In France, the famous *Ecole des Beaux Arts* at Paris, celebrated its two hundred and fiftieth anniversary in 1901. At the *Institut de France* the subject for competition for the *Grand Prix de Rome* in architecture was of especial interest to Americans—"An American Academy of Arts and Sciences at Paris to be constructed on a portion of the sites of the demolished fortifications." The *Grand Prix* was awarded to M. Hulot, a pupil of M. Marcel Lambert. Of the two permanent buildings that remain of the 1900 Exposition—the *Grand Palais* and *La Petit Palais des Beaux Arts*, the palm is awarded the latter; and in French architecture of the year the striking features in Paris are the Quai d'Orsay railway station, the beautiful *Musée Galliera*, the *mairie* of the tenth *arrondissement*, many handsome private residences, and, at Tours, the new city hall. Open competitive designs were received for a museum at Clermont-Ferrand, a church at Grenoble, a circus-theatre at Troyes, covered markets at Auxerre, and public schools at Havre. The subject for the tenth annual government competition was a public hospital. The first prize was awarded to M. Clabant.

In Germany, some of the architectural productions of 1901, while bearing a national imprint, by the peculiarity of their designs gave rise to the query, "Is German architecture decadent?" The completion of the *Befreiungshalle* at Kelheim, Bavaria, endowed that city with a splendid and classic structure.

Austro-Hungarian architecture was marked by the completion of the magnificent Houses of Parliament at Buda-Pesth, commenced in 1885.

In Greece, the first prize for designs for a palace of justice at Athens was awarded to M. Alexandre Nicoloudis, a Greek architect at Paris. In Italy, archi-

ture was not at a standstill, as evidenced by the progress or completion of the splendid National Art Gallery at Rome, in Renaissance, or Bramantesque, the Salimbeni palace at Siena, a synagogue at Florence, a new bridge at Pisa, a theatre at Palermo, the peculiar Mole Antonietta in memory of Victor Emmanuel at Turin, the arch and gallery also dedicated to the late king at Milan, and numerous fine commercial and residential edifices throughout the country.

ARCTIC EXPLORATION. Two expeditions were in the field in 1901 for the purpose of testing two rival routes to the North Pole. A third expedition for the purpose of testing a third route was proposed, but the commander could not fit out his ship in time to start. Of the many "royal roads to the pole", among which Arctic authority has vacillated during the last quarter of a century, all have been abandoned except these three. The first two—the Smith Sound route and the Franz Josef Land route—involve the establishment of headquarters on solid ground as far north as possible, and a dash with sledges and dogs northward across the frozen sea. The third route—Nansen's route—involves a drift in a ship, frozen into the ice-pack, across the Arctic Ocean from some point north of Siberia. Captain Bernier, a Canadian, announced in 1900 that he would undertake this last route; but he could not make his preparations in time to set off in 1901. The other two expeditions are in command of Americans. All these expeditions are avowedly seeking the Pole. The collection of scientific data is a secondary object in the published plans of each leader.

Robert E. Peary and the Smith Sound Route.—The news that Mr. Robert E. Peary, C.E., U. S. N., had discovered the northern extremity of Greenland reached the United States in September, 1901. The sledge trip by which Mr. Peary accomplished this exploration was made in the spring of 1900. The leader, accompanied by Dr. T. S. Diedrick and by his colored servant, Matthew Henson, began his expedition in 1898. Funds for the maintenance of his work are supplied by the Peary Arctic Club, an organization of influential men who are interested in Mr. Peary's enterprise. The leader established preliminary headquarters at Etah, on the west coast of Greenland; and, during his first season, transported supplies across Smith Sound and northward to Fort Conger, but in doing so froze seven toes, which had to be amputated. Nevertheless, news reached this country, in the fall of 1900, that in March of that year Mr. Peary was at Fort Conger, intending to start early in April upon his sledge trip to the Pole. Meanwhile, in July, 1900, the *Windward*, a ship owned by the Peary Arctic Club, bearing supplies for Mr. Peary, and, as passengers, his wife and daughter, had started to communicate with the explorer. The *Windward* did not return in the fall, and many authorities in Arctic matters believed that she had been lost in the ice. On July 15, 1901, the *Erik*, a steamship chartered by the Peary Arctic Club, in command of Mr. Herbert L. Bridgman, secretary of the club, sailed from Sydney to ascertain the condition of both the explorer and the *Windward*. On September 13, the *Erik* returned to North Sydney, Cape Breton, bringing Mrs. Peary and her daughter as well as the news of Mr. Peary's success in 1900, his abortive expedition in 1901, and his intention to make another effort to reach the Pole in the spring of 1902. The *Windward* had passed the winter of 1900-01 in Payer Harbor, near Cape Sabine. There the *Erik* found her August 4, and the two ships spent the available time before it was necessary to return to this country (August 29) in hunting walrus for dog food, and in transferring supplies from Etah to Mr. Peary's new headquarters at Herschel Bay, ten miles south of Cape Sabine. Meanwhile Dr. Diedrick resigned from the expedition. His resignation was accepted by Mr. Peary and he was ordered home; but he went ashore, ostensibly to hunt rabbits at Etah, and sent an announcement by Eskimos that he intended to stay there over the winter in order that, in case of need, the explorers might have a physician within reach. Remonstrance proved unavailing, and rather than use force, the leader permitted him to remain. Members of the auxiliary party supplied him with a gun and some ammunition. His intention was to live among the Eskimos, in Eskimo fashion, eating seal and walrus, and sleeping in Eskimo igloos, and to make studies of this aboriginal tribe, which is isolated from the rest of the world and thus retains its primitive characteristics. Dr. Diedrick's resolution to remain excited a good deal of discussion in the newspapers, and theories were advanced that he intended to undertake on his own account a trip to the Pole; but members of the auxiliary expedition deemed this hardly credible. A seaman and cook, named Charles Percy, volunteered to join Mr. Peary in his future work and was accepted. The *Erik* brought back also journals and other relics abandoned at Fort Conger by the Lady Franklin Bay Expedition under Lieutenant (now General) A. W. Greely, when it left its headquarters in 1883.

Mr. Peary's Sledge Journey.—Mr. Peary left Fort Conger, lat. 81° 44' N., on April 15, 1900, with Henson and five Eskimos. He crossed Robeson Channel and

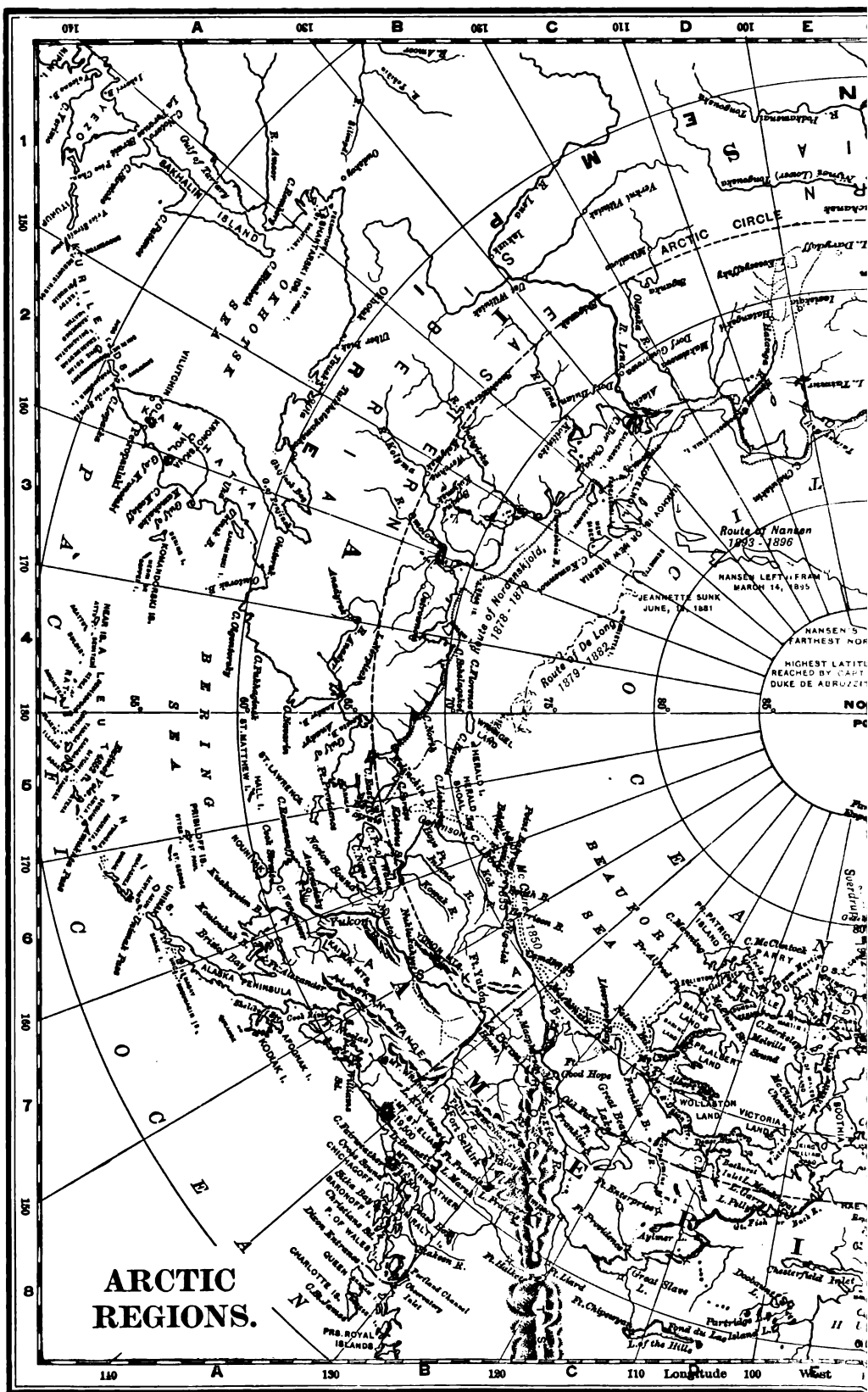
proceeded northward along the West Greenland coast. He sent back two natives from Blackhorn Cliffs on April 26, and early in May two more from Cape Britannia. On May 8 he opened the cairn built May 13, 1882, by Lockwood and Brainerd, of the Lady Franklin Bay Expedition, at $83^{\circ} 24'$, the record of the "farthest north" on land which had held for eighteen years. From this cairn he took a thermometer, a spy glass, and some records, which were afterwards brought back by the *Erik*. He then pushed on with Henson and the Eskimo, Ahngmalukto, to $83^{\circ} 39' N.$, where the coast began to trend southward. He deposited a cairn with records and then struck out due north over the sea ice. He reached $83^{\circ} 50' N.$; the ice beyond him was not difficult and he was in condition to proceed further, and possibly to surpass all records; but he perceived that the journey to the Pole itself was not feasible, and, therefore, instead of attempting to make a record, he proceeded southeastward, for the purpose of defining the northern boundary of the archipelago which lies above Greenland. About 160 miles beyond Lockwood and Brainerd's cairn, in lat. $83^{\circ} N.$ long. $25^{\circ} W.$, he came within sight of a mountain to the southward seen by him looking north from Independence Bay on the east coast of Greenland, July 4, 1892. He turned about May 22, and on June 10 reached Fort Conger. During the winter he explored a part of Grinnell Land, and shot a few musk-oxen. On the fifth of April, 1901, with Henson and five natives he started again; but this time approached the sea-ice from the north of Grinnell Land. But the winter had been hard and neither men nor dogs were in condition for their best work, and after ten days the explorers turned back toward Cape Sabine, where on May 6 they found the *Windward* awaiting them. Before the *Erik* arrived, August 4, Mr. Peary had replenished his supplies at Fort Conger and had laid a line of caches from Cape Sabine to this base of operations. His plan was to attack the frozen sea at Cape Hecla, in the north of Grinnell Land, in April, 1902. During the summer of that year a ship will be sent by the Peary Arctic Club to ascertain the outcome of this sledge journey.

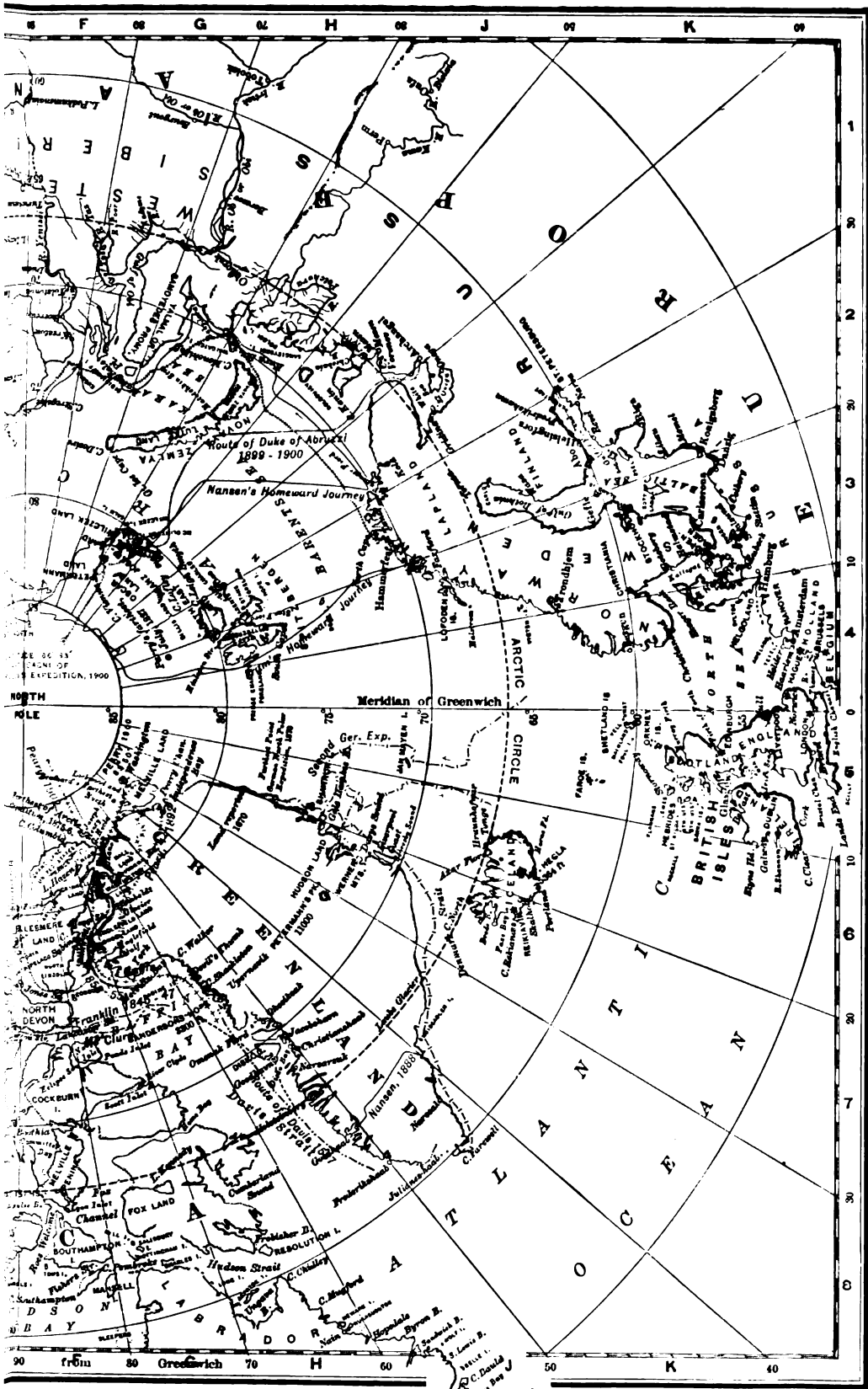
Results of Mr. Peary's Expedition.—No report has been published of what Mr. Peary may have accomplished in the line of purely scientific research. That he will have valuable ethnological information is unquestioned by Arctic authorities. He is a conscientious surveyor, and has undoubtedly corrected errors known to exist in the maps of the regions which he has visited for the first time. In previous years he has made extensive observations of glacial phenomena and has probably continued them during this present expedition. The accounts of his explorations are valuable mainly as a basis for future expeditions. He has demonstrated that in all probability the Greenland archipelago ends south of the 84th parallel. The Smith Sound route, then, is not as explorers had hoped, a land route to the Pole. Future explorers must commit themselves to the uncertainties of the shifting ice pack. Mr. Peary has determined to venture out upon this ice pack at a point some sixty miles south of the most northern land. If he does not succeed in reaching the Pole, then the Smith Sound route will be thrown open to other explorers.

The Stein Expedition.—The *Windward*, which followed the *Erik* home, brought back Mr. Robert Stein and Dr. Samuel Warmbath of the Stein expedition to Ellesmere Land. This expedition of three men obtained transportation in 1899 on the auxiliary steamer which communicated with Mr. Peary. The expedition was landed on Ellesmere Land. It was very inadequately equipped and accomplished nothing of note in the way of exploration. Dr. Leopold Kahn, the third member of the party, returned home from Cape York by a Dundee whaler in 1900. Mr. Peary eked out with provisions the scanty supplies of the remaining members of the party and gave them passage home.

Captain Sverdrup and the Fram.—No news has been received of this Norwegian expedition, which started in 1898, by the Smith Sound route, to explore the northern regions of Greenland, and perhaps to circumnavigate the island. In 1899 the *Fram* and Mr. Peary's ship, the *Windward*, sighted each other in Kane Basin. The Norwegians had made some explorations in Ellesmere Land, but had been checked by the ice from proceeding beyond Kane Basin. The *Fram* was last seen in August, 1899. Mr. Peary deems it impossible that she could have passed Fort Conger without his seeing her, and the supposition is that she may have abandoned the plan of investigating upper Greenland and have turned her attention to Jones's Sound. Jones's Sound is much incumbered with ice, and it is feared that the *Fram* may be beset. She has supplies for five years, of which three have now elapsed. It is rumored that plans for a relief expedition are being formulated in Norway.

The Baldwin-Ziegler Expedition and the Franz Josef Land Route.—Mr. Evelyn B. Baldwin (*q.v.*) has chosen as his base of operations Franz Josef Land, from which Captain Cagni, of the Abruzzi expedition, in 1900, started on the sledge journey which reached $86^{\circ} 33'$, the "farthest north." In general, Mr. Baldwin's plans comprise: (1) the establishment of a base of supplies on the northernmost point of the Franz Josef Land Archipelago, and, if possible, the establishment of a line of sup-





plies out upon the ice north of all land; (2) a sledge journey across the ice pack to the Pole; and (3) a return southwestward in the course of the Greenland current to either Koldeway Island or Shannon Island on the East Greenland coast. For the accomplishment of these plans, Mr. Baldwin is provided with multifarious devices. For his expedition, funds practically unlimited were furnished by Mr. William Ziegler, of Brooklyn, and no Arctic expedition, not even the famous Nares expedition, has been so elaborately equipped as this. The leader has three ships: (1) the Dundee whaler, *Esquimaux*, renamed the *America*, a barque-rigged steamship of 466 tons, which was completely refitted at Dundee for special service as the flagship of the expedition, with new decks, new masts, and accommodations for making the crew unusually comfortable; (2) her tender, the *Frithjof*, a steamer of 260 tons; and (3) the *Belgica*, a barque which transported the expedition under Lieutenant de Gerlache, that first passed a winter below the Antarctic circle (1898-99). Mr. Baldwin has four houses in parts ready to put together; and these, being constructed with a double shell, can be turned into eight if necessary, at the will of the leader. He has in addition to a comfortable supply of ordinary canned foods, and the standard food for sledge journeys, pemmican, a large number of new condensed foods; 8,000 pounds of coffee in tablets; 1,500 tins of crystallized eggs, etc. In all, he has 200 tons of concentrated food.

Forty Balloons.—In order to mark the advance of his party, and in general to give out records of his work, Mr. Baldwin is supplied with forty balloons, each holding 3,000 cubic feet of hydrogen gas produced by the vitriolic process. To each of these balloons ten top-shaped cork buoys, copper sheathed and weighted with lead, each buoy weighing ten pounds, are attached by a rope. When the escape of gas causes a balloon to fall so low that the lowest buoy strikes the ice, a device releases the buoy, and relieved of its weight, the balloon springs up once more, and so on until all the buoys are set free. In each buoy there is a hollow brass tube which contains records showing the accomplishments of the party to the time when the balloon was sent up. The buoys are painted red and blue, and each is provided with a metal American flag. It is expected that they will float with currents until they are picked up, and thus they will furnish records of the set of the water in the Arctic Ocean.

Dogs as Food.—One of the main problems of Arctic exploration has been to find food for the dogs which drag the provisions of the men. Mr. Baldwin has a hundred tons of dog food, but does not depend on that alone for the subsistence of his draft animals. It is his intention to cause a portion of this food to transport itself; that is, he means to carry along, loose, less efficient dogs as food for those which are better able to stand the strain of hauling the sledges. To use the weakest dogs as food for the strongest, has been, as a matter of fact, the practice of all Arctic explorers; but none has equipped himself for the purpose as deliberately as has Mr. Baldwin. He has 420 dogs—no other expedition has had more than a third of the number. Another device of his is to cause the dogs which are not dragging sledges to bear their own provisions in packs fastened on their backs. He has also fifteen Siberian draft ponies, intended to do the heavy work in the first stages of his journey, and ultimately to become dog food.

Mr. Baldwin's Party.—To carry out the various duties which such a large expedition demands, Mr. Baldwin has forty-one men, including six Siberian dog drivers. His first aim is avowedly to reach the North Pole; but he does not mean to neglect scientific observations, and has a full set of scientific instruments to determine the meteorology, the terrestrial magnetism, the geodesy, the tides, and the topography of Franz Josef Land. He has a very complete photographic apparatus, including even a moving-picture machine. Mr. Baldwin himself is a meteorologist, and among his comrades are men especially equipped to fill each scientific function of the expedition.

Movements of the Expedition.—The three vessels foregathered at Tromsø, Norway. The *Frithjof* left July 17, 1901, for Cape Flora, bearing a party of hunters who were to begin the campaign by shooting walrus and white bear for dog food. The *Belgica* left Sandefjord July 25, for either Koldeway Island or Shannon Island on the Greenland coast, bearing three houses, sledges, food to be deposited along the Greenland coast sufficient for twelve men for a year, and signal-poles to be erected along this coast. The *America* left with the *Frithjof*, but went first to Solombala, Russia, to pick up the dogs. After a stormy passage of three weeks, she reached Franz Josef Land August 14, and with the *Frithjof* proceeded north to Markham Sound, and established a headquarters on the southwest coast of Alger Island, 80° 20' N. 55° 52' E. The ice ahead was so thick that the *Frithjof*, which had to return and could not risk delay, did not dare to enter it. Before she left the *America* to come home, thirty-two polar bears and sixty-two walrus had been killed for dog food.

Mr. Baldwin's Plans for 1902.—It was Mr. Baldwin's intention to push the *America*

into the ice as far north as possible, and when she should become permanently beset, to advance over the ice with dogs and ponies—each of which will drag as much as twenty dogs—to the farthest attainable point and there to establish permanent headquarters. He hopes that these headquarters will be above the 83d parallel, fifty miles or so north of the point of departure selected by Mr. Peary. It is his estimate that this station will be about 550 miles from the Pole. With lightly laden sledges—only fifty to sixty pounds per draft dog, instead of the hundred pounds usually assigned to these animals—he expects to proceed rapidly. His calculation is that he can accomplish the journey to the Pole and back to Greenland in about a hundred days. He will begin to establish his advance stations on the ice about March 2, after the sun has returned from its winter's absence, and about the first of April the main sledge party will leave Franz Josef Land.

The Melville-Bryant Drift Casks.—Ever since the famous pair of breeches lost from the *Jeannette*, north of Siberia, turned up in Greenland, there has been widespread speculation as to the character of the currents which set across the North Pole. Nansen made a partial test of one of these currents. A more comprehensive test is now being conducted by means of casks placed on the ice-floes north of Behring Strait. Each cask is numbered and the latitude and longitude where it is thrown overboard is noted. The plan originated with Rear-Admiral George W. Melville, the chief engineer of the United States Navy, the hero of the *Jeannette* expedition, the discoverer of De Long's remains, and the chief engineer of the Greely Relief Expedition. The president of the Philadelphia Geographical Society, Mr. Henry G. Bryant, who was the leader of one of the Peary auxiliary expeditions, and second in command of another, interested the Society in the plan, and the Society determined to provide the casks. In all, fifty casks have been placed upon the ice floes by whalers, and also by the revenue cutter *Bear*, stationed on the coast of Alaska, which began this year with fifteen casks. The casks are made of heavy oak staves bound with iron hoops, and each has a capacity of about twenty gallons and contains a sealed bottle, in which is a paper instructing the finder to note the spot where the cask was picked up, and to send the records to the nearest United States consul.

The Duc d'Abruzzi's Search Expedition.—The Duke of the Abruzzi sent an expedition in the summer of 1901 to seek traces of the three men who were lost from one of Captain Cagni's sledge expeditions in the preceding summer. The search expedition in the steamer *Capella* spent the open season in Franz Josef Land, but failed to find any traces of the missing men. A memorial to them was erected at Cape Flora.

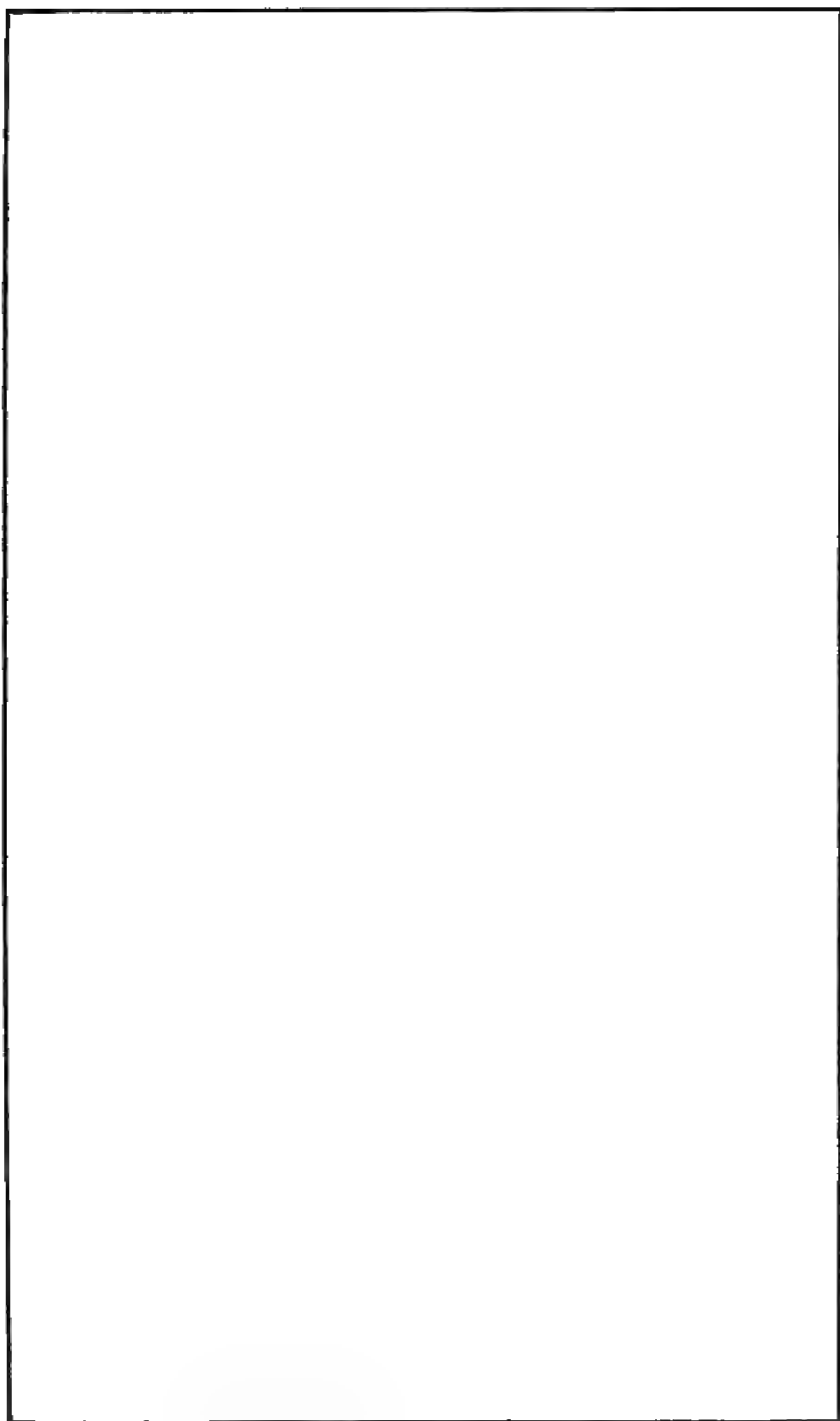
The Ermak.—The Russian ice-breaking steamship *Ermak* in 1901 again visited the polar sea near Spitzbergen. Ostensibly her object was to aid the Russian members of the party which was measuring the magnetic arc. According to the announcement in the fall of 1900, however, her commander intended to test her powers against the Arctic ice packs with a view of a possible discovery of the Pole. Against the wide and heavy floes of the ocean she proved a failure. It was reported, however, that she had made five trips between Novaya Zemlya and Franz Josef Land.

Captain Bauendahl's Expedition.—News arrived by the Hamburg American liner *Augusta Victoria* that Captain Bauendahl, who had started in 1900 in the small fishing boat *Matador*, to reach the Pole from the north of Spitzbergen, had wintered at Dane Island, had sent his ship home, and had started with one companion, a Norwegian, to the east coast of Greenland with the intention of proceeding up the coast to the Pole.

The Magnetic Arc Measurements.—The Russians and Swedes who are measuring a magnetic arc at Spitzbergen, spent their third summer there in 1901, and the work is not yet finished. The Russians determined all the points in the triangulation which fell to their share. But the Swedes, whose department was the north of the group of islands, being obstructed by the ice, were not able to complete their task. The expedition used the steamship *Antarctic*, which was afterwards bought by Heer Nordenskjöld for his Antarctic expedition.

The Toll Expedition.—The expedition under Baron Toll, which started in 1900 to carry on explorations in Sannikoff Land, reached the Gulf of Taimur. During the sledging season, a member of the party pushed on to the Nordenskjöld Islands. Baron Toll himself began the exploration of Chelyuskin. Lieut. Kalomütseff, of Baron Toll's party, in the steamship *Zaria*, wintered in the Bay of Taimur (76° 8' N.). During the winter Lieut. Kalomütseff tried twice to reach Kamchatka overland, but without success. The *Zaria* returned to Yeneseisk for coal in the summer, and set forth again to establish a coaling station on Dickson Bay.

Future Expeditions.—Several enterprising explorers announced in 1901 the plans of expeditions by which they mean to reach the Pole. The most picturesque was that of Dr. Anschütz-Kämpfe, who intended to equip himself with a submarine boat



ARCTIC EXPLORATION.—The Baldwin-Ziegler Expedition. Evelyn B. Baldwin, Leader (Left); William Ziegler, Patron (Right). Flagship, *America*.

which should proceed beneath the ice. She was to be 70 feet long and 26 feet wide, with a capacity of 3,500 cubic feet of air—enough to last five men for 15 hours. She was to be propelled and guided, forward and up and down, by horizontal and vertical screws driven respectively by a 40 horse-power and a 5 horse-power engine. She could carry 150 tons of petroleum to feed a 220-volt accumulator. Her speed under water would be 3 knots an hour. The leader calculated that in the 15 hours during which his air would last he could make 45 knots, and that no Arctic floe could be 45 knots wide. Sometime in the course of that distance, therefore, he must come across an opening or "lead" in the ice and then he would rise to the surface and replenish his air. In case no lead should be discovered, he would find a thin place in the ice—indicated by his manometer—and blast a hole through. This plan, taken directly from Jules Verne, has been received as by no means preposterous; but it has not yet been put into execution.

Mr. Walter Wellman has announced that he too will try to reach the Pole, and that he has bought for the purpose the steamer *Magdalena*. But he has not publicly announced the details of his plans.

The Northern Magnetic Pole will be the object of an expedition announced for 1902 by R. Amundsen, a Norwegian, who was a member of the Belgian expedition to the Antarctic regions in 1898-99.

ARGENTINA, a republic on the Atlantic coast of South America. The capital is Buenos Ayres.

Area, Population, Education.—The estimated area of the 14 provinces and 9 territories is 1,113,849 square miles, and the population (census of 1895) 3,954,911. According to a French report the population of Argentina at the beginning of 1901 was 4,800,000, of whom 1,250,000 were foreigners; among these were 635,000 Italians, 250,000 Spaniards, 115,000 French, 60,000 Orientals, 20,000 English, 26,000 Chilians, 22,000 Germans, 20,000 Russians, and 20,000 Swiss. The estimated population of Buenos Ayres on April 30, 1901, was 829,896. In 1900 the immigrants numbered 105,902, of whom 84,851 came directly to Argentine ports, while the remainder first landed at Montevideo; of the 84,851, 52,143 were Italians and 20,383 Spaniards; the Germans numbered only 760.

Primary instruction is free, secular, and nominally compulsory; in 1899 the primary schools numbered 4,291, with an enrollment of 427,331 pupils. There are lycées and normal schools for secondary education, and for higher education two national and three provincial universities. The reported number of periodicals and newspapers in Argentina in March, 1901, was 739, of which 94 were dailies and 256 weeklies; 682 were published in Spanish and 24 in Italian.

Government.—The chief executive authority is vested in a president, who is elected for a term of six years, and appoints a responsible ministry; the president since October 12, 1898, has been Señor Julio A. Roca. The legislative power devolves upon congress of two houses, the senate and the house of deputies. The several states elect their own legislatures and governors.

The effective army numbers over 29,000. In October, 1901, the congress adopted a bill imposing obligatory military service; privileges, however, were granted to conscripts for purchasing exemption. The navy comprises 5 armored cruisers, 3 high-speed coast-defense cruisers, 4 coast defense armor-clads, 7 smaller gunboats and cruisers, 22 torpedo boats, 4 torpedo-boat destroyers, and a number of older craft. The naval complement, in addition to the marines, consists of 656 officers and 7,760 seamen.

Finance.—The most important sources of revenue are import duties and excise; by far the largest item of expenditure is interest on the public debt. The silver peso is worth 96.5 cents, and the paper peso about 44 cents. In 1899 the revenue was 70,978,627 pesos (26,453,972 pesos, gold, and 101,192,399 pesos, paper), and the expenditure 70,978,587 pesos. The revenue in 1900 was 65,301,119 pesos (37,937,805 pesos, gold, and 62,189,352 pesos, paper), and the expenditure 60,538,941 pesos (20,980,230 pesos, gold, and 89,906,110 pesos, paper). The estimated revenue for 1901 was 37,991,718 pesos (gold) and 63,300,000 pesos (currency), and the estimated expenditure 26,025,176 pesos (gold) and 89,940,499 pesos (currency).

According to a statement published in Buenos Ayres in the summer of 1901, the total foreign debt of Argentina, payable in gold, was 386,004,118 pesos; the internal debt amounted to 6,349,000 pesos gold, and 96,819,854 pesos currency. In 1900 the total floating debt amounted to 19,892,000 pesos. In his message to the congress in May, 1901, the president stated that, after a ten-years' suspension of amortization, service would be resumed in July, since for this purpose there was already in London a sum of £1,000,000. There was some agitation against the law promulgated in November, 1899, for the conversion of the paper currency, but it was stated in July, 1901, that the law would not be repealed, and that the president would sanction no further issue of paper money. It was expected that by the end of the year the conversion fund would reach nearly \$15,000,000. See paragraph Unification Bill.

Industries and Commerce.—As a producer of pastoral and agricultural commodities, Argentina is becoming one of the most important countries in the world. Its prominence in the production of wheat, corn, flax, linseed, and in the breeding of sheep and cattle is assured. In 1901 the estimated number of cattle in the country was 30,000,000.

The gold value of dutiable imports in 1899 was 102,080,738 pesos, and free 14,769,933 pesos—total, 116,850,671 pesos; the dutiable exports for the same year amounted to 100,868,723 pesos, and free 84,049,108 pesos—total, 184,917,831 pesos. In 1900 dutiable imports were 96,502,452 pesos, and free 16,982,617 pesos—total, 113,485,069 pesos; the dutiable exports 56,169,377 pesos, and free 98,431,035 pesos—total, 154,600,412 pesos. The total imports in 1900, accordingly, compared with those of 1899, show a decrease of 2.8 per cent. and the exports a decrease of 16.3 per cent. The chief causes for the decline of the export trade in 1900 were the foot-and-mouth disease, which caused some European countries to prohibit the importation of Argentine cattle; a falling off in the prices of wool; and floods, which caused the loss of many millions of sheep. As compared with 1899 there was a decrease in pastoral products amounting to 44,293,020 pesos, while agricultural products showed an increase of 12,270,361 pesos. Imports to Argentina by countries have been reported in gold pesos as follows:

	1899.	1900.		1899.	1900.
Great Britain...	43,671,421	38,682,753	France	10,979,690	10,897,866
Germany	12,979,937	16,635,613	Belgium	9,410,479	8,430,880
Italy	13,780,072	14,924,498	Brazil	4,806,116	3,741,877
United States...	15,466,846	13,438,529	Spain	3,197,882	3,691,998

Exports from Argentina by countries have been reported in gold pesos as follows:

	1899.	1900.		1899.	1900.
Great Britain...	21,721,591	23,800,686	United States...	7,667,523	6,882,763
Germany	29,433,663	20,070,133	Brazil	7,041,668	6,185,507
France	41,446,747	19,007,960	Italy	4,926,612	4,304,154
Belgium	24,478,370	17,980,885	Netherlands ...		3,906,082

From the foregoing figures it may be seen that in 1900 the percentages of imports and exports, respectively, were: Great Britain, 34.1 and 15.5; Germany, 14.7 and 13; Italy, 13.1 and 2.8; the United States, 11.9 and 4.5; and France, 9.6 and 12.3. In 1899 the export of wheat to Great Britain was inconsiderable, while in 1900 32.5 per cent. of the British import came from Argentina. This was 48 per cent. of the Argentine export. Of the corn export in 1900, 46 per cent. went to Great Britain.

The leading exports reported for 1900 include the following, the unit of quantity being the metric ton of 2,204.6 pounds: Wheat, 1,929,676 (70,902,729 bushels); wheat flour and bran, 106,831; corn, 713,248 (28,079,224 bushels); wool, 101,113 (222,915,720 pounds); linseed, 223,257; hay, 102,836; sheepskins, 28,713; tallow, 17,794; ox-hides, 3,359,463 in number; frozen withers, 2,372,939 in number; quebracho, 221,223. During the first six months of 1901 there was an increase in most of the exports as compared with 1900, excepting wheat, in which there was a heavy decline. The foreign shipping entered in 1898 aggregated 6,555,128 tons, and in 1899 6,939,567 tons.

Communications.—The railways were reported to have a total length at the beginning of 1900 of 16,413 kilometres (10,199 miles); of the 24 railway lines, 3 aggregating 2,007 kilometres belong to the state, and the remainder are private property. The private lines represent chiefly English capital, which is stated to be over \$425,600,000. In 1901 the third railway between Buenos Ayres and Rosario, 249 miles distant, was under construction. (For the Transandean Railway, see CHILE, paragraph Communications.) In 1900 there were 27,584 miles of telegraph line. The telephone lines in 1901 had a total length of 9,350 miles (27,584 kilometres); the capital invested, of which four-fifths was foreign, amounted to about \$5,060,000.

The Unification Bill.—On June 11, 1901, a bill was introduced in congress authorizing the issue, at 4 per cent., of Argentine consolidated stock, redeemable in fifty years, for the purpose of the partial or total conversion of existing foreign debts, "whenever such conversion might benefit the government." This bill, which was a government measure, was passed by the senate and by a majority of one was recommended for enactment by the finance committee of the lower house. The measure was opposed by the Argentine press and the public generally, since it was feared that a unification of the foreign debt would place Argentine finances in the power of English capitalists. A petition was laid before the congress, and the public opposition became so bitter that on July 3 and 4 riotous demonstrations took place in Buenos Ayres, and the offices of two journals favoring the administration were demolished. On July 5 a rigorous censorship was established, and in the city and suburbs a state of siege was decreed for six months. On the same day the president decided that in the interest of public convenience it was advisable to postpone

definitely the unification bill, whereupon the minister of finance resigned. The president's action caused some subsidence in the public excitement, and in a few weeks martial law was no longer necessary.

For the trouble with Chile at the end of the year, see CHILE (paragraph Events of 1901).

ARIZONA, a southwestern Territory of the United States, has an area of 112,920 square miles. The capital is Phoenix. Arizona was organized as a Territory February 24, 1863. The population in 1900 was 122,212, while in June, 1901, as estimated by the government actuary, it was 127,000. The largest city is Tucson, with a population in 1900 of 7,531.

Finances.—The receipts of the treasury for the calendar year 1901 were \$394,891.62, and the expenditures, including warrants, interest, and bonds paid, were \$355,521.60, leaving in the treasury \$104,407.20. The state tax rate for the year was 85 cents on each hundred dollars valuation. The total value of property in the Territory as returned for taxation was \$38,853,831.37. The total bonded debt was \$2,620,000, from which, however, should be deducted funded, county, and city indebtedness to the amount of \$1,634,027.57. At the same time the floating debt was \$215,347.75, giving a total territorial indebtedness, minus county and city indebtedness, of \$1,201,220.18.

Industries.—Although the census reports of 1900 show a large percentage of increase in the manufacturing interests of Arizona since 1870, the aggregate value of the products is small. The Territory is primarily a mining and stock-raising region, mechanical industries being limited to those relating essentially to the building up of new countries. During the thirty years ending with 1900, the average number of industrial wage-earners increased from 84 to 3,268. In the latter year, the amount of actual capital, exclusive of capital stock, invested in 314 establishments reporting was \$10,157,408, and the gross value of the products, inclusive of materials re-used in the process of manufacture was \$21,315,189. The smelting and refining of ores with a product in 1900 valued at \$17,286,517; car construction and repair-shop work, with a product valued at \$887,482; and the manufacture of lumber and timber products valued at \$547,790 are the most important industries; numerous so-called "neighborhood industries" exist, the products of which are consumed at or near the point of production.

Agriculture.—The main wealth of Arizona at present is in its mines, and, owing to the difficulty of irrigation and the practical impossibility of irrigating the northern part of the Territory, it appears that Arizona will never become a largely producing agricultural territory. The principal crop is alfalfa, while corn, wheat, and barley are also raised. In the southern part of the State, where the fruit orchards are dependent upon irrigation, canals have been established with considerable success. Experimental work has also been done with sugar beets, although they have not yet been produced in commercial quantities. The overshadowing importance of live-stock interests in Arizona is seen in the fact that while the improved land and buildings in 1900 had a reported value of \$13,682,960, live stock alone had a reported value of \$15,458,717. Prices for live stock were reported to have been excellent in 1901, and shipments from the Territory were very heavy. The number of cattle returned for taxation was 281,541, and of sheep 377,936. The general health conditions of all classes of live stock is said to be better than in any other part of the United States, the climate being healthful, and a wise system of sanitary laws enforced.

Irrigation.—The question of irrigation in Arizona, at least in the southern part along the Gila River and its tributary, the Salt River, is one of great importance to the future of agriculture in the Territory. Since 1890, 545 miles of canals have been constructed at a cost of \$1,508,469. Of the 5,809 farms in the Territory, 4,210 are irrigated and 1,599 are unirrigated. The average value of unirrigated land, according to the census figures, is placed at \$43.50 an acre, while that for the best irrigated land is from \$60 to \$200 an acre. But how small a proportion this irrigated land bears to the whole Territory is shown by the fact that of the 72,268,800 acres of land in Arizona, only 5,723,757 acres have been appropriated, while only 1,935,327 acres, or 2.7 per cent. of the total Territorial area, were included in farms in 1900, and of these 1,935,327 acres only 254,521 acres, or .35 per cent. of the entire area, were improved lands. Owing to the fact that the Colorado River and its tributaries in the north of Arizona flow mainly in deeply eroded cañons through regions of high plateaus, the Gila and Salt river system in the southern part of the Territory form practically the only available system for irrigation purposes. Millions of acres might here, in the governor's opinion, be made profitable for agricultural crops by building reservoirs and storing the flood waters. The storage problem, as presented by the governor in his annual report for 1901, is twofold: first, to increase the water supply in existing canal systems whose volume of water is insufficient in the dry season; and, second, to supply water for the reclamation of large areas of the so-called desert or public domain. This latter is said to be especially important, because while there are

millions of acres of government land still open, there is hardly an additional acre available until the water supply is increased. Under existing circumstances it appears impossible to induce private capital to build the great reservoirs necessary for this purpose. For, in the first place, since so much of the land belongs to the government no sufficient return would be insured to the capitalist, and, in the second place, it has been erroneously assumed from experiments made in California that reservoir building and canal digging for irrigation purposes is unprofitable in any event. On the other hand, it is doubtful if the federal government can be brought to construct these reservoirs, while the resources of Arizona are insufficient for the Territorial government to attempt the work. But if the United States would cede to the Territory the arid lands at present useless, the Territory could make these lands the basis for inducing private capital to enter upon irrigation work. This last course is especially recommended by the governor not only on the ground that the arid lands are, under existing conditions, of no possible value to the government, but on the further ground that their reclamation under Territorial supervision would indirectly reimburse the United States through the increased prosperity of the whole region.

Mining.—The mining interests of Arizona continue to increase. A new feature of its mining has been the profitable sinking of shafts to a considerable depth, it having been previously thought that the mines of Arizona were on the whole very shallow. The large production of copper continues to be sustained, the total production of electrolytic copper in the Territory in 1900 being 466,922,663 pounds. The value of the copper production for 1900 was estimated at \$17,286,517, and the output for 1901 was estimated at fully as much. Gold and silver mining continue on the same scale as previously. The estimated output of gold for the calendar year 1900 was valued at \$3,500,000, and of silver \$2,592,500. The remarkable development of the oil fields of California and Texas has greatly stimulated the search for oil in Arizona. Numerous companies have been formed and extensive tracts of land have been located and surveyed with the expectation of finding flowing wells of petroleum. Petroleum would be of very great advantage to the Territory, as the price of fuel is at present so high as greatly to retard the development of manufactures.

Needs of the Territory.—As stated by the governor in his annual report for 1901, the most pressing need of Arizona, and one to which her population and wealth undeniably entitle her, is statehood. It is not especially, as the governor remarks, for sentimental reasons that Arizona asks that this right be conferred upon her, nor is it because the present Territorial government deprives the people of practical self-government; but it is mainly because the material interests of Arizona are at present placed under a great disadvantage. For some reason, as alleged by the governor, capital is more or less suspicious of territories. New railroads, the exploitation of mines, the development of agricultural products, and the construction of storage reservoirs for irrigation are all urgently needed, and private capital from other States, it is believed, would readily come to the aid of these enterprises under a State government, whereas at present they will not. "I predict," said the governor in this connection, "that within five years after the Territory is admitted into the Union there will be created within the borders of the new State more wealth than all that is now assessed, and that the population will be quadrupled." Other recommendations made by the governor for federal legislation were: that all public lands within the Territory should be ceded to Arizona; that until these lands were ceded authority should be granted to the Territory to lease the grazing lands; that all lands within the Territory be surveyed; that a government assay office and a branch mint be established in Arizona; that an appropriation be made for artesian water exploration within the Territory; and that the government proceed with the construction of the proposed reservoir dams near San Carlos on the Gila River.

Legislation.—In compliance with the provision of an act passed by the twentieth legislative assembly, a commission known as the Code Commission, consisting of three members of the Territorial bar, was appointed to revise the statutes of the Territory and the penal code. The report of this commission was submitted to the twenty-first assembly on January 1, 1901, and its construction and adoption constituted the most important work of the session. Aside from the revision of the statutes, at the session of the twenty-first assembly an act was passed authorizing an issue of Territorial bonds in the sum of \$35,000 to cover the expenses of representation at the St. Louis Exposition in 1903; an act exempting from taxation for ten years all railroads, the construction of which should be begun within one year; the repeal of an act of the twentieth assembly requiring the payment of a poll tax before registration for voting; an act authorizing the appointment of water storage commissioners; an act providing for the construction of a reform school for vicious youth; an act making a tax levy for the Territorial prison at Yuma and passed over the veto of the governor; and an act providing for the dedication of the capitol building.

State Officers.—Governor, M. O. Murphy; secretary, Isaac T. Stoddard; treasurer,

T. W. Pemberton; auditor, G. W. Vickers; attorney-general, C. A. Ainsworth; superintendent of education, R. L. Long—all Republicans. Supreme Court: chief justice, Webster Street; associate justices, Richard E. Sloan, Fletcher M. Doan, George R. Davis—all Republicans.

ARKANSAS, a south central State of the United States, has an area of 53,045 square miles. The capital is Little Rock. Arkansas was organized as a Territory March 2, 1819, and admitted as a State June 15, 1836. The population in 1900 was 1,311,564, while in June, 1901, as estimated by the government actuary, it was 1,331,000. The populations of the largest cities in 1900 were: Little Rock, 38,307; Fort Smith, 11,587; Pine Bluff, 11,496; and Hot Springs, 9,973.

Industries.—As in many other sections of the country that are predominantly agricultural, Arkansas has shown a steady growth in manufacturing and mechanical industries during the last half century. Since 1850 the population has increased from 209,897 to 1,311,564, or 524.9 per cent.; while the average number of wage-earners in industrial pursuits has increased from 842 to 26,501, or 3,047.4 per cent. In 1900, according to the census reports, there was invested in 4,794 industrial establishments reporting, a capital of \$35,960,640, exclusive of capital stock. In the same year the gross value of manufactured products was \$44,883,783, and the net or true value of the products, exclusive of products re-used in the process of manufacture, was \$28,481,699. The leading industry of the State is the manufacture of lumber and timber. The value of these products in 1900 was \$23,959,983, or 53.4 per cent. of the total value of the manufactured products of the State in that year. This industry, which showed an increase during the decade of 167.9 per cent., is dependent upon the extensive forests in Arkansas, estimated in 1898 to cover 25,600,000 acres, or more than three-fourths of the total area of the State. In the south of the State the wood is largely pine; in the eastern alluvial districts there are extensive cyprus swamps; and in the north there are great bodies of fine oak, walnut, hickory, and ash. Related to this industry is that of planing-mill products—sash, doors, blinds, etc.—whose value in 1900 was \$2,266,522. Flour and grist milling ranks second in importance among the industries of the State, having products in 1900 valued at \$3,708,709. The manufacture of cotton-seed oil and cake, from cotton material formerly thrown away, produced values amounting to \$2,874,864 in the year. The number of cotton-ginning establishments increased from 137 in 1890 to 1,150 in 1900, or 739.4 per cent. But these figures do not include private plantation ginneries or ginneries connected with saw, grist, or cotton-seed oil machinery. Both cotton-ginning and cotton-seed oil manufacture are dependent upon the large cotton production of the State, amounting in 1899 to 719,453 bales, or 7.5 per cent. of the total production of the country. Railroad construction and repair shops produced in 1900 products valued at \$2,095,447, and publishing products valued at \$839,787. Little Rock, the largest manufacturing city in the State, produced industrial products valued at 10.3 per cent. of the total products of the State, and paid 15.9 per cent. of all industrial wages of the State.

Legislation.—Among acts passed by the Arkansas legislature in 1901 were the following: Congress was applied to under Article V. of the Constitution to propose an amendment authorizing the election of senators of the United States by direct vote. The Arkansas representatives in Congress were requested to endeavor to have federal legislation passed for the improvement of the Ouachita River so as to make it navigable at all seasons from Arkadelphia down; also to use all reasonable means to obtain an appropriation to open navigation on the St. Francis River in townships 17, 18, and 19 north, range 7, 8, and 9 east, the river being already navigable below these places and also for 100 miles above. Banks were prohibited from receiving deposits when insolvent, and the penalty for violation of this act was made a felony punishable by from three to five years' imprisonment. Foreign corporations which had not appointed an agent upon whom process might be served might be sued by service upon the auditor of the State. Cities of over 2,500 inhabitants were authorized to establish and maintain public libraries. The pension law for ex-Confederate soldiers was made more liberal. For this purpose the pension tax was increased from $\frac{1}{4}$ to $\frac{3}{4}$ of a mill on all taxable property; the pension to widows of Confederate soldiers was raised from \$25 to \$100 per annum, provided they did not own more than \$400 worth of property, and the pension given by existing law of \$100 to soldiers of the Confederate army who had been totally incapacitated from wounds received in service was extended to those who had since the war become incapacitated from any cause. Moreover to Confederate soldiers who were partially disabled from any cause a maximum of \$75 per annum was to be awarded. A collateral inheritance tax of 5 per cent. was imposed upon all property, real and personal, which was bequeathed to any one except a mother, father, husband, wife, lineal descendant, adopted child, or lineal descendant of an adopted child. A rather curious law regarding dentistry provided that in future any one desiring to practice that profession must present a certificate of graduation from an authorized dental school, or must pass an examination showing that he was "reasonably well qualified" for his profes-

sion. But no time limit of study or other specifications of what constituted "reasonable qualifications" were prescribed. By existing law, all executions in the State are private, but this law was modified so that executions for rape are to be public, it being believed that this publicity would act as a deterrent to negro crime. An act which caused a considerable sensation in college fraternity circles throughout the country was one prohibiting secret fraternities in the University of Arkansas. Under this law it was enacted that after September 1, 1901, no student who was a member of a secret fraternity should receive any class honors or compete for any prize or honor offered by the University, unless such student filed with the president of the University a renunciation of his society and an agreement to have nothing further to do with it during his attendance at the University; and no teacher was thereafter to be employed at the University unless he also filed his renunciation of the secret college fraternity to which he belonged.

Liquor Laws.—Owing to the difficulty experienced in Arkansas in preventing the sale of liquor in districts where it had been made unlawful, several acts were passed intended to make the violation of the law more difficult. It was made unlawful for any persons selling liquor where the sale was lawful to solicit orders in places where the sale was unlawful. Congress was petitioned to pass such legislation as would prevent the issuance of a United States revenue license for the manufacture or sale of alcoholic liquors in the prohibited districts; it being well known that where many persons would not hesitate to violate the State laws, very few would run the risk of running athwart the federal power. A bill similar to that of Texas, passed in 1900, designating the place where liquor is delivered as the place of the sale of liquor, and in addition, making carriers the legal agents of liquor dealers, was vetoed by the governor on the ground that the measure violated the interstate commerce law, and would cause a revulsion of feeling against the existing liquor legislation.

Labor Laws.—An act for the protection of laborers made it unlawful for a corporation to pay its laborers in any form of scrip or token of indebtedness that was not redeemable in lawful money at the regular pay day; directed the courts to construe all scrip issued by companies as promises to pay lawful money; made it unlawful for any company to coerce its employees to trade at a "company store"; and directed that if a firm or corporation charged for merchandise at its store more than a reasonable rate, or the current market rate, the employee might recover damages to double the extent that he was injured. But mining concerns employing less than 20 men were exempted from this law, and mining corporations were further favored by an amendment to the law of 1899, providing that all coal mined should be paid for by weight and should be weighed before it was screened, which amendment directed that this law should not have effect if the miners should contract or agree with their employers otherwise.

Trust Laws.—In the campaign of 1900, the passage of more stringent anti-trust laws was one of the issues of the election, and this issue was made especially prominent because Mr. Jefferson Davis, when attorney-general, had endeavored under the provisions of the existing trust law to suppress insurance companies which maintained agreements as to premium rates. Checked in this by the Supreme Court of the State, Mr. Davis ran for governor on the platform of more stringent laws, and in his inaugural message recommended that corporations which were members of a pool, wherever formed, should be prohibited from transacting any business in the State, and that any contract with a trust should be declared void. Much surprise was expressed, therefore, when bills introduced in the legislature upon the governor's recommendations, taxing life-insurance policies and franchises and making more stringent regulations generally concerning trusts, failed of passage. A further reaction from the socialistic or populist sentiment of the State a few years earlier was seen in the repeal of the law of 1897, which created a State board authorized to locate, establish, and operate railroads and telegraphs in the name of the State. And this reaction was further instanced in an act authorizing the formation, under the laws of manufacturing and other business corporations, of street railway companies to build and operate private street railways throughout the State.

Other Legislation.—The powers of municipal corporations were enlarged so that they might construct, acquire, and operate municipal lighting plants. The franchises and all other railroad property which might be acquired by lease by another railroad company was made subject to the lessee maintaining the property in good condition and affording reasonably prompt traveling facilities to the public. Another act regarding railroads provided that all passenger trains on the St. Louis, Iron Mountain and Southern Railway Company, excepting trains No. 55 and 56, known as the "Cannon Ball," should be required to stop at Corning, in Clay County. The exception made by the law was probably due to recent decisions of the United States Supreme Court in the case of Illinois and other States holding that through

trains doing an interstate commerce business were not under the jurisdiction of State authorities.

State Officers.—Holding office in 1901 and through 1902: Governor, Jefferson Davis, Democrat, elected for 2 years, term expires in January, 1903; secretary of state, John W. Crockett; auditor, T. C. Monroe; treasurer, Thomas E. Little; attorney-general, George W. Murphy; superintendent of education, J. J. Dayne; commissioner of agriculture, Frank Hill; commissioner of public lands, John W. Colquitt. Supreme Court—Chief justice, Henry G. Bunn; associate justices, Burrill B. Battle, Simon P. Hughes, Carroll D. Wood, and James E. Riddick, all Republicans.

Congressional Representatives (57th Congress).—In the House: P. D. McCulloch, Jr., from Marianna; John S. Little, from Greenwood; Thomas C. McRae, from Prescott; Charles C. Reid, from Morrilton; Hugh A. Dinsmore, from Fayetteville, and S. Brundidge, Jr., from Searcy, all Democrats. In the Senate: James K. Jones (until 1903), from Washington, and James Berry (until 1907), from Bentonville, both Democrats.

ARMENIA and Kurdistan, Turkish territory in eastern Asia Minor, comprising the three vilayets of Erzerum, Mamuret-ul-Aziz (Kharput), and Diarbekir, and the districts of Bitlis and Van, have an estimated area of 72,491 square miles and a population variously estimated at from 2,500,000 to 5,000,000. The Armenians are Gregorian Christians, who, though retaining their own ritual, acknowledge the authority of the Pope of Rome. The persecutions which reached their climax in the atrocities of 1894 and 1895 have since continued, despite the Porte's promises of reform. From Moslem Kurds and even Turkish troops the country has suffered fire, pillage, massacre, and the outrage of its women, but no one of the Powers has intervened. Throughout July and August, 1901, desultory Kurdish outrages harassed the Bitlis district. In September conditions appeared to be most serious; the situation at Sassun was critical, and from Mush there came shocking reports of bloodshed, pillage, and fire. In that month the disturbances at Mush were quelled by the governor of Bitlis, commanding four battalions of troops. Many subsequent outrages, however, were reported, but no Turk or Kurd, it was stated in October, had been arrested since July. The authorities seemed to place all the blame on the Armenians and punished them accordingly. It was reported in November that fighting had taken place between Turkish troops and Armenians at Sassun, and in December that while quiet prevailed at Kharput outrages in the districts of Erzerum, Van, Diarbekir, and Bitlis were being continued by Hamidieh Kurds, against whom the authorities were either powerless or unwilling to act. In November, 1901, severe earthquake shocks destroyed a large part of the town of Erzerum, including the Armenian church and the Greek schools, and over a score of persons were killed.

ARMIES. See articles on the various countries.

ARMOUR, HERMAN O., American capitalist, died at Saratoga, N. Y., September 8, 1901. He was born at Stockbridge, N. Y., March 7, 1837, the brother of P. D. Armour (*q.v.*), and went into the grain commission business in Chicago in 1862. In 1875 he joined the firm of Plankinton, Armour and Co., and later became the New York representative of Armour and Co. At the time of his death he was a vice-president and director of the company.

ARMOUR, PHILIP DANFORTH, American capitalist and philanthropist, died in Chicago, January 6, 1901. He was born on a farm at Stockbridge, N. Y., May 16, 1832, and received a common-school education. In 1852, being seized with the then raging gold-fever, he traveled overland to California, most of the distance on foot. In four years he returned East with sufficient capital to establish himself in trade, which he did at Milwaukee, in the grain and warehouse business. Successful in this, he became in 1863 leading member of Armour, Plankinton and Co., pork packers, with headquarters in the same city and branches in others. In 1875 the main office was transferred to Chicago and the business absorbed that of Herman O. Armour (*q.v.*), dealer in grain and pork. Thereafter the ramifications of the business caused a reorganization. Armour and Co. was formed, Herman was sent to New York to manage the exports and two other brothers sent to Kansas City, Simeon at the head of the branch there, and Arthur as president of the Armour Bank, while Philip remained in Chicago as executive head of the system. The operations of the company increased rapidly, until now it owns more grain elevators than any house in the world, employs 50,000 persons, exports to every civilized country, while its transactions for a single year have exceeded \$102,000,000. This extraordinary success was due to the shrewdness and business sagacity of Mr. Armour, who, aside from revolutionizing the pork-packing industry, displayed a daring initiative and keenness of judgment in his market transactions that, more than merely increasing his own capital, overawed his competitors, secured unlimited credit for the house, and more than once averted serious financial distress. Out of his vast personal fortune he gave wisely and generously to works of prac-

tical charity. The chief beneficiaries of his liberality are the Armour Institute of Technology and the Armour Mission, both of Chicago, representing a combined endowment of \$2,500,000. Of his two sons, J. Ogden, the only surviving one, succeeded to the control of the allied Armour interests.

ARRAN, Fifth Earl of, **ARTHUR SAUNDERS WILLIAM CHARLES FOX GORE**, British peer, died in London, March 14, 1901. He was born January 6, 1839, and after being educated at Eton, entered the diplomatic service in 1859. He was an attaché successively at Hanover, Stuttgart, Lisbon, Vienna, and Paris, and resigned in 1864, after which, until 1884, he was a special income tax commissioner, and from 1888 until his death, lord-lieutenant of County Mayo, Ireland. In 1884 he succeeded his father as earl and in the same year was created a baron of the United Kingdom, entering the House of Lords as Baron Sudley.

ARROYO, **OSCAR**, American politician, died at New Orleans, La., November 3, 1901. He was born in Louisiana in 1823, a descendant of the original Spanish settlers from the Canary Islands. As provost-marshal of Plaquemines he was driven to Shreveport when the Union army captured New Orleans during the Civil War, and then became secretary to Governor and Confederate General Allen. At various times he served as clerk of the State Senate (1877), as secretary of state (1884), as special commissioner of Louisiana to investigate Civil War claims (1892), and as cashier of the United States mint at New Orleans.

ART STUDENTS' LEAGUE of New York, was founded in 1875 for the purpose of organizing and conducting classes in painting, drawing, modeling and composition. The home of the club is at 215 West Fifty-seventh Street, New York City. Membership, 423; number of students, 960. Advisory director, John La Farge; president, C. Y. Turner; secretary, Mary S. Lloyd.

ASBESTOS. The production of asbestos in 1900 was 1,054 short tons, valued at \$16,310, as compared with 1899, whose production was 681 short tons, valued at \$11,740 dollars. The imports in 1900 were valued at \$355,951, while those of 1899 were only \$312,068. Canada alone produced 30,641 short tons in 1900, the value of which was \$763,431. There has been developed recently a new deposit of asbestos on Belvedere Mountain, in Lowell and Lamoille townships, Vermont. The discovery and opening up of these deposits, which will no doubt produce important quantities in 1902, is of great importance, and although they may only supply second and third grades of asbestos at first, still indications point to the presence of large quantities of the mineral. At present nearly all the asbestos used in this country is obtained from deposits at Black Lake, and Thetford, Canada.

ASCENSION, an isolated island 700 miles northwest of St. Helena, is a British possession having an area of only 35 square miles, and a population of 430, consisting of officers, seamen, marines, and their families, and 177 Kroomen. It is a coaling and store depot for the British West African squadron. In April, 1901, a direct cable was laid between the island and Sierra Leone, on the African coast.

ASHANTI. See **GOLD COAST**.

ASHLEY, **WILLIAM JAMES**, economic historian and teacher, was chosen in 1901 to organize and conduct the projected school of commerce at the University of Birmingham. He was born in London, February 25, 1860, and was educated at St. Olave's Grammar School, Southwark; at Balliol College, Oxford, where he was a history scholar; and at Lincoln College, where he held a fellowship and a lectureship in 1885-88. From 1888 to 1892 he was professor of political economy and constitutional history at Toronto University, and then was called to Harvard University to become professor of economic history, a chair which he occupied until selected to organize the new faculty at Birmingham. Among his many publications on economic subjects are *Introduction to English Economic History and Theory*; *The Middle Ages* (1888); *The End of the Middle Ages* (1893); and *Surveys Historic and Economic* (1900). He was also editor of the *Economic Classics*, translating for the series Schmolli's *Mercantile System* (1896) and Turgot's *Reflections* (1898).

ASIA. For map see **PERSIA**.

ASIA MINOR. See **ARCHÆOLOGY** (paragraph Asia Minor) and **TURKEY**.

ASPHALTUM. Under asphaltum are included the purer forms of the hard and soft bitumen known as elaterite, gilsonite, albertite, wurzilite, uintaite, nigrile, maltha, brea, etc. Where the material is found forming impregnations in the porous rock it is known as bituminous rock. The production of asphaltum and bituminous rock in 1900 amounted to 54,389 short tons, valued at \$415,958, as compared with the production of 75,085 short tons, valued at \$553,904, in 1899. This quantity was supplied by the States of California, Kentucky, Utah, Texas, and Colorado. A large quantity of asphaltum and bituminous rock was also imported, most of the foreign supply coming from Trinidad and Bermudez, in Venezuela,

while smaller quantities came from Switzerland, France, Germany, Cuba, and Mexico. The value of the domestic production of 1900 was 9 per cent. less than the imports, which amounted to 118,771 long tons, valued at \$454,732. The imports from Trinidad increased nearly 36 per cent. between 1899 and 1900, and the amount imported from Venezuela was nearly three times that imported during 1899. G. H. Eldridge has prepared a valuable paper on the asphalt and bituminous rock deposits of the United States, in which he describes the distribution of the several varieties. The purer forms occur in the form of veins, of which he mentions a remarkable example found in Utah near the Colorado line, which has a maximum width of 18 feet and a continuous length of ten miles. Some of the bituminous rock deposits are very large, one being mentioned in Indian Territory which forms a bed 350 feet thick, impregnated from top to bottom and traceable for over two miles. The percentage of bitumen in the rocks shows a maximum of 14 per cent. in the case of the limestones and 20 per cent. in the case of sandstones. H. E. Peckham has written a paper *On the Bituminous Deposits Situated to the South and East of Cardenas, Cuba, American Journal of Science*, July, 1901.

ASQUITH, HERBERT HENRY, M.P., a prominent Liberal leader, in a speech at a Liberal dinner, replying to addresses delivered at a great pro-Boer mass meeting in London, on June 20, 1901, committed himself and his branch of the party to a firm support of the cause of Great Britain in the war against the Boers in South Africa. It was Mr. Asquith's contention that the Liberals were not of necessity supporters of the Boers, and he claimed the right to hold whatever opinion suited him in regard to this question, without being accused of party disloyalty. Mr. Asquith was born in Yorkshire in 1852 and was educated at the City of London School and Balliol College, Oxford. After engaging in law practice for some years, he entered Parliament (1886). His career was brilliant, and he rose to the position of home secretary under Gladstone in 1892, but left the ministry upon the defeat of the Rosebery cabinet in 1895. He is a member of the House of Commons, sitting for East Fife.

ASSEMBLY, GENERAL. See PRESBYTERIAN CHURCH IN THE UNITED STATES OF AMERICA (NORTH) and PRESBYTERIAN CHURCH IN THE UNITED STATES (SOUTH).

ASSOCIATE REFORMED SYNOD OF THE SOUTH, organized in 1821, a member of the alliance of Reformed churches holding the Presbyterian system, and the only independent division of Associate Reformed Presbyterians. According to the last reports available it has 11,344 communicants and 8,367 Sabbath school teachers and scholars, with over a hundred ministers and churches. The next meeting of the synod is in November, 1902. Stated clerk, Rev. James Boyce, Due West, S. C.

ASSOCIATED PRESS, an organization having for its object the collection and sale of news to its members among the press of the country, was first incorporated in Michigan, later in Illinois, and later still, as the outcome of a suit with the Inter-Ocean Publishing Co., of Chicago, reincorporated (1900) under the laws of the State of New York. At the annual meeting held in New York City, September 18, 1901, the following directors were elected, viz.: F. B. Noyes, Washington *Star*; C. W. Knapp, St. Louis *Republic*; V. F. Lawson, Chicago *Record*; Stephen O'Meara, Boston *Journal*; A. J. Barr, Pittsburg *Post*; H. W. Scott, Portland *Oregonian*; George Thomson, St. Paul *Despatch*; W. L. McLean, Philadelphia *Evening Bulletin*; Clark Howell, Atlanta *Constitution*; H. Ridder, New York *Staats-Zeitung*; T. G. Rapier, New Orleans *Picayune*; C. P. Taft, Cincinnati *Times-Star*; C. H. Grasty, Baltimore *Evening News*; Whitelaw Reid, New York *Tribune*; M. H. De Young, San Francisco *Chronicle*. The directors subsequently elected F. B. Noyes president and Melville E. Stone secretary and general manager.

ASSOCIATION OF IDEAS. See PSYCHOLOGY, EXPERIMENTAL.

ASSOCIATIONS BILL. See FRANCE (paragraphs on History).

ASTRONOMICAL PROGRESS DURING THE YEAR 1901. The two most interesting events of the year were the blazing forth of a new and brilliant star, and the discovery of a minor planet pursuing a specially remarkable orbit. In the following pages we have described these occurrences briefly, and have also called attention to advances made in other departments of astronomical science.

New Star in the Constellation Perseus.—Perhaps the most striking thing in 1901 was the sudden appearance of this very bright object, at a point in the sky where no star had been known to exist before. Such a phenomenon is of great importance to the advance of astronomical science, and also of high interest to the general public. It is as if a new world had come into existence suddenly before our eyes. On the morning of February 22, not very long before twilight, Anderson, of Edinburgh, first saw this star, and estimated it as being between the second and third magnitudes. Daylight soon intervened, and it was not seen again until early even-

ing twilight made it possible to attempt further observations. At seven o'clock Copeland, of the Edinburgh observatory, saw it as a white star; and it was then almost of the first magnitude. Owing to difference in time, it was not possible to observe the star in the United States until a few hours later, since darkness always sets in on the European side of the Atlantic while it is still early afternoon in America. When it was observed at Harvard College on the evening of the 22nd it was described as a white star and its magnitude was estimated to be 0.9. This fractional designation of magnitude signifies that the observers thought it more brilliant than an average star of the first magnitude; for it must not be supposed that all the so-called first magnitude stars are really equal in brilliancy. Probably no two stars in the sky are exactly alike; and astronomers have adopted as the standard first magnitude a brilliancy near the average of the so-called first magnitude stars. Thus, stars like Sirius, that are more brilliant than the average first magnitude, are designated by fractional or even negative numbers; so that the magnitude assigned by the Harvard College observers to the new star simply indicates that they considered it somewhat brighter than the standard first magnitude. Even more remarkable fluctuations of light soon followed; for later in the same evening the magnitude was estimated as 0.35; and after the lapse of twenty-four hours, on the night of the 23rd, the new star culminated by blazing up to a brilliancy almost equaling the brightest star in the heavens. Its light-giving power could be estimated only approximately, and was set down as 0.0. One night later, on the 24th, observers all agreed that the object had already lost some of its extraordinary splendor. In thus blazing up within a few hours from absolute invisibility to such an extraordinary degree of luminosity the Perseus Nova has but one or two parallels in the written annals of astronomy. We have on record but fourteen cases of these so-called temporary stars or *Novæ*. They always appear suddenly, reach their greatest power within a few days, and then fade out again more slowly, in a period of time measurable by months. The first authenticated instance occurred in the year 134 B. C.; and this was the star which led Hipparchus to construct the first stellar catalogue ever made. Hipparchus saw the importance of the event which had come under his observation, and recognized that similar occurrences could be detected easily in the future, if an accurate record were made of the stars then actually visible in the sky.

The star most nearly resembling the one of this year appeared in November, 1572, in the constellation Cassiopeia. This *nova* first attracted the attention of Tycho Brahe to astronomical studies, and may be regarded as the primary cause of the advances our science owes to the labors of that remarkable man. Tycho was able to observe his star for sixteen months; and it is recorded that when brightest it rivaled even the planet Venus at her best. The position of the star was measured with respect to a number of neighboring ones by Tycho; so that we know, at least approximately, the exact point of the sky where it appeared. His results were published in 1573.

The further light changes of the star of 1901, as we have already mentioned, began with the decline first observed on the 24th of February. This decline continued; and by the latter part of March the *nova* was no longer a conspicuous object, though it continued to be visible in the telescope. Several times it was noted that the light fluctuated; its steady diminution seemed to be interrupted for a few days by slight increase in brilliancy.

Astronomers have given much attention to possible explanations of the phenomena of temporary stars. In the case of the present object we have been able to add considerably to our stock of observational material by noting the changes made visible by the spectroscope. Probably the most reasonable theory to account for the whole phenomenon is the so-called "Collision Theory." If a massive dark body, moving very rapidly through space, were to come into collision with some other similar body, the force of impact would undoubtedly evolve an enormous quantity of heat. This would raise the temperature of the two bodies until the matter composing them would be melted and later perhaps even vaporized wholly or in part. Such an evolution of heat would naturally be accompanied also with the production of light; in other words, we should be able to see something where previously there had been but one or more dark bodies. It is possible that space contains regions of considerable extent filled with some sort of cosmic matter, possibly very attenuated, possibly varying in density in different parts. The phenomenon of a new star could be well explained on the supposition of a compact dark mass moving very rapidly through some such region as this. We have not space to enter here into the rather intricate details of spectroscopic observations, which offer the greatest difficulties to theorists; but nearly all the facts that have become known might be due to a collision of the kind just mentioned.

Later in 1901 the new star began to show certain extraordinary changes that will probably render it absolutely unique in the class to which it belongs. In the latter

part of August the *nova* appeared to be surrounded with a species of nebulosity,—as if the materials composing the star were widening out. These appearances were especially well shown in photographs. Some astronomers were of opinion at the time that they were not caused by real nebular matter surrounding the *nova*, but that there was some peculiarity in the kind of light emanating from it which might be made to account for the observations. For instance, it might happen that the light of the *nova* was such that a photographic telescope accurately focused for the kind of light received from ordinary stars would be out of focus for the kind of light from the new star. In other words, to make a good photograph of the *nova* it might be necessary to alter somewhat from their ordinary positions the screws by which the photographic plate is adjusted to the focal plane of the telescope. Of course, if the photographs were made out of focus one would expect a sort of halo surrounding the star's image on the plate. But these notions were soon overcome by further experiment and observation; and it is now practically certain that the *nova* has actually put out a nebula. It is not possible to emphasize too strongly the interest and importance of this observation. The unfolding thus of successive early steps in a cosmic evolutionary development actually under the very eyes of the observer is an opportunity never before offered to astronomical science.

The observations thus far described are not all; at the present time of writing it is not possible to foretell just what developments will take place. But certain observations made at the very end of the year, at the Lick Observatory in California, foreshadow developments even more startling than those described. On November 11 telegraphic information was sent out to astronomers that Perrine, of the Lick Observatory, had photographed the *nova*, and found that the nebula surrounding it had at least four condensations, or *nuclei*, and that these were in motion towards the southeast. On the 12th it was announced from the Yerkes Observatory that Ritchey had been able to confirm these motions of the nebular matter from a photograph taken November 9. The motion was such as to amount to one minute of arc in six weeks; and this velocity is very many times larger than the thwart motion across the sky of any other object in the sidereal heavens. To what vast linear translation such an apparent motion may correspond it is impossible to say. If we knew the distance separating us from the *nova* we could calculate how many miles per second it must move to produce an apparent displacement of one minute of arc in six weeks. If the observed motion really exists, the material composing these nuclei is changing its position in space at least as rapidly as 1,500 miles in a single second of time. It is possible, of course, that these last phenomena, more astonishing perhaps than any others connected with the new star, may be due to some form of error in the photographs, or to some optical cause, and not to really existing motions. The decision must be left to future observation; but so much is certain: the year 1901 saw one of those really great cosmic catastrophes such as require the birth or destruction of a universe to make them possible.

Total Solar Eclipse.—A total eclipse of the sun occurred on May 18, 1901, and, as usual, a number of scientific expeditions were sent out to observe it. These eclipses are never visible from more than a very small portion of the earth's surface; and not infrequently it so chances that this small portion is situated in some far-distant and inaccessible part of the earth. On the present occasion the most favorable observing stations were on the island of Sumatra, and on certain other adjacent islands. Several parties therefore went to Sumatra, proceeding from America, England, Holland, etc. It was also possible to see the eclipse from Mauritius; and an English astronomer was located there as well, since it is always desirable to view these astronomical phenomena from widely separated stations, whenever possible.

We have not space to do more than enumerate very briefly the most important results obtained. The weather at Sumatra was quite unfavorable; but the clouds, though interfering very much with the projected photographic observations, were not sufficiently continuous or dense to cause a total failure. Pictures of the corona were obtained showing very clearly the form and shape of that outermost appendage of the sun. The corona was of the type that usually appears at eclipses occurring near periods of sun-spot minimum. It would, indeed, appear that there is some connection between the sun-spots and the corona, for it has been ascertained that the frequency of these spots in any year increases and diminishes with a well-defined periodicity. Furthermore, from the few eclipses so far observed, we find that the type of corona has a similar kind of variation. The present eclipse was no exception to this highly probable rule.

The "flash" spectrum was successfully photographed once more. This is one of the most interesting observations possible at a total solar eclipse. As the eclipse progresses, and the moon's advancing edge gradually covers the sun more and more, just before complete totality, there are a few moments when we receive light exclusively from the very outermost layer of the sun's disc. The spectrum of this light

can be photographed in these few moments, and it is found to differ entirely from the ordinary solar spectrum. The differences are such that they can best be explained by assuming the solar layer from which this light comes to be gaseous and incandescent. This conclusion has been strengthened by the spectroscopic observations of the present eclipse.

Another important class of observations usually made at solar eclipses relates to the search for an "intra-Mercurial" planet. For many years astronomers have suspected the possible existence of a planet traveling around the sun in an orbit interior to that of Mercury. Such a planet would never be visible at ordinary times; for its close proximity to the sun would prevent our seeing it in the blaze of solar light, even with very powerful telescopes. During a total solar eclipse is the time to glimpse it, if ever. Photographs were made on the present occasion covering a wide region around the sun. They show many stars, some as faint as the sixth magnitude, and it is certain that they would have revealed the position of the hypothetical planet, if it were as bright as the fourth stellar magnitude. Results were altogether negative, however, and we must postpone further search to the next occasion of a total eclipse.

New Planetoid with Remarkable Orbit.—The photographic method of discovering previously unknown planetoids that is in use at the astronomical station maintained by the Observatory of Harvard College at Arequipa, Peru, led to the detection in 1901, of a little planet pursuing an orbit quite out of the ordinary. The probability of interesting results flowing from the search for new planetoids has been increased by the discovery of Eros in 1898, a discovery which will most probably add much to our knowledge of the mechanism of the solar system. On August 14, Stewart made a photograph at Arequipa upon which appeared the image of a planetoid distant only 28° from the south pole of the heavens. This is a most unusual position on the sky for a planet, since these bodies are usually found near the so-called "ecliptic," a circle which nowhere approaches either pole of the heavens nearer than 76° . The first observation stamped the planetoid as something special among its fellows, and therefore a series of photographs were at once undertaken, and from these the planet's course throughout three months has been obtained. A preliminary orbit has been computed from the photographic observations; and, as was expected, the planet turns out to have the "outside" orbit among all the planetoids. The ellipticity exceeds that of any other minor planet, being greater than those of Eva (164) or Istria (183), which pursue the most eccentric planetary orbits hitherto known.

Meteors.—Efforts were again made in 1901 to observe the November shower of Leonids. It will be remembered that a repetition of the extraordinary showers of 1799, 1833, and 1866 was expected in 1899 and 1900, but the hopes of astronomers were disappointed. It would appear that some process of perturbation arising from the gravitational attractions of the other members of our solar system has succeeded in so altering either the orbit of the meteoric masses, or the position of the denser portion of the swarm in that orbit, as to prevent a recurrence of the remarkably interesting meteoric phenomena recorded at intervals of about thirty-three years during the last century. This non-appearance of meteoric bodies was all the more disappointing because astronomers are now prepared to observe them with far better apparatus; for what formerly could have been only seen and described might have been photographed. It was hoped that the measurement of meteoric trails upon photographs taken simultaneously at stations several miles apart would have made possible the accurate calculation of the parallax of the meteors; or, in other words, the determination of their elevation above the terrestrial surface. This important experiment would have been successful beyond a doubt, if the meteors had been visible.

The attempt at observation in 1901, however, was slightly more successful than in the preceding year. Several good meteor trails were formed on the developed negatives; and perhaps some light may be thrown on meteoric problems from their measurement.

Stockwell's New "Saros."—The Chaldean astronomers of old used to predict the occurrence of eclipses by means of the so-called Saros. They had observed that these phenomena recur at intervals of eighteen years and eleven and one-third days; so that it was always easy for them to predict new eclipses by simply counting ahead from the old ones that had been observed and entered in their records. It is now possible to explain the cause of the Chaldean Saros, and to prove that it is not mathematically exact, but merely a close approximation to the facts of Nature. To bring about an eclipse, it is necessary that the orbital motions of sun, moon and earth bring these three bodies into one and the same straight line, or very nearly so. When this occurs, if the moon is between sun and earth we have a solar eclipse, because the moon cuts off the sun's light and prevents our seeing that luminary. Similarly, if the earth is between sun and moon, the solar light is cut off from the

moon, leaving that body dark and therefore invisible to us. The third alternative of the sun passing between earth and moon is, of course, impossible from the nature of the terrestrial and lunar orbits.

Now, if the orbits of earth and moon were in the same plane, there would be two eclipses in each lunar month; for the moon, in circling round the earth, would then pass through the straight line joining earth and sun twice in each revolution. One of these two eclipses would be solar, corresponding to the position of the moon when nearest the sun, and the other lunar, when the moon was on the other side of the earth, furthest from the sun. But the two orbits are not in a single plane, and therefore the moon does not necessarily pass through the line joining sun and earth in the course of each monthly revolution. But the two orbit planes have, of course, a line of intersection, a line along which the two planes meet. This line is called the line of nodes, and it is when sun and moon in their respective orbital planes happen to be near this common line at the same time that we have an eclipse.

Now, suppose an eclipse to have occurred exactly on this line of nodes. At the end of one lunar revolution around the earth, which is called a lunation, the moon would be back again at the line of nodes. Not so the sun, however; for the orbital circuit of the earth around the sun takes a solar year, not merely a lunation. Therefore, the sun would at that time appear in the sky about one-twelfth of a revolution away from the nodal line. The exact amount by which the sun thus appears to move from the nodal line in one lunation is $30^{\circ}.670$, taking account of gravitational perturbations of the orbits of earth and moon. If we calculate multiples of this number, and disregard always multiples of complete revolutions of 360° , we find that:

In	47	lunations,	distance from node is	.....	$1^{\circ}.513$
"	88	"	"	"	..... 179.003
"	135	"	"	"	..... 180.516
"	223	"	"	"	..... 359.519
"	358	"	"	"	..... 180.035

All these numbers are near 0° , 180° , or 360° ; and they signify that if the sun and moon were exactly in the nodal line together at any moment of time, then at the expiration, for instance, of 223 lunations, they would again be within $0^{\circ}.481$ ($360^{\circ} - 359^{\circ}.519$) of the nodal line together, and this would be quite near enough to cause an eclipse. Similarly, it appears that at the end of 358 lunations, they would be within $0^{\circ}.035$ ($180^{\circ}.035 - 180^{\circ}$) of the node at the other end of the nodal line.

The period of 223 lunations is the Saros; that of 358 lunations the new cycle discovered by Stockwell. We shall proceed to consider briefly their relative merits. It is obvious at a glance that neither the Stockwell cycle nor the Saros is absolutely exact; but of the two, Stockwell's comes nearer to the truth. Its error amounts to only $0^{\circ}.035$, while that of the Saros is $0^{\circ}.481$. The effect of these small errors is to bring about a gradual accumulation which will ultimately prevent such cycles from performing their duty of eclipse prediction. It can be shown by means of mathematical calculations that the Chaldean Saros will continue to predict recurrences of the same eclipse during a period of about thirteen centuries; and during about eight of those centuries the eclipse will be what is called "central"; i. e., an eclipse of very large obscuration. After the lapse of 1,300 years, the accumulated error will prevent the Saros from again predicting recurrences of that eclipse. In the case of Stockwell's cycle, on the other hand, the duration of correct predicting is nearly three hundred centuries, during 181 of which the eclipse is central.

At a first glance, therefore, it would seem that the new cycle is a great improvement over the old Chaldean one; and such is indeed the fact, so far as the simple prediction of eclipse dates is concerned. But the Saros possesses an incidental advantage not belonging to the new cycle, and this fact will doubtless prevent its passing out of use. It so happens that the Saros period repeats the circumstances of an eclipse with considerable accuracy, as well as the date of its occurrence. Successive reappearances of an eclipse at intervals of one Saros will be similar in character, will reappear in the same terrestrial hemisphere, and be visible in nearly the same latitudes. In the Stockwell cycle, on the other hand, the reappearances jump about all over the earth as to visibility, and do not show the same kind of eclipse at each recurrence. On the whole, therefore, we may conclude that while the Stockwell cycle is of great interest and importance, it will not replace the Saros, except perhaps in cases where prediction through a very large number of centuries is a desideratum.

Universal Standard Time.—The use of standard, or zone, time instead of local time has become nearly universal. In January, 1901, Spain joined the majority of other civilized nations, and is now reckoning time by Greenwich, England. Differences of local time are a necessary and unavoidable consequence of using the sun's

daily motion as our time measurer. For the sun, after rising in the east, slowly climbs up in the sky, passes the meridian at its greatest altitude or elevation, and then sinks again to set behind the western horizon. We call the time noon when the sun is on the meridian. Therefore, it must inevitably happen that the instant of noon will not be simultaneous for the whole earth. When the sun is on the meridian of one city it will have already passed the meridians of certain other cities, and will not yet have reached the meridians of still others; and as a consequence of the direction of solar motion from east to west, it must pass the meridians of eastern cities first. In other words, when it is noon at any given place it is already afternoon in all places to the east, and not yet noon in all places to the west. Of any two places, the more easterly has the later time; when it is nine o'clock in the westerly place, for instance, it is perhaps already nine-thirty or ten in the easterly.

The quantity of such time-difference between any two places depends on how far apart they are in an east-and-west direction; the further they are, the greater their time-difference. But east-and-west distances on the earth are best measured as longitude differences; and, in fact, the difference in time between any two places can be computed at once from their longitude difference by a very simple rule. The time difference, in hours, is just one-fifteenth the longitude difference, in degrees; or fifteen degrees of longitude difference correspond to a time difference of exactly one hour. To utilize this simple relation practically, the following excellent system has come into use, after being first adopted in the United States. A series of standard longitude meridians were selected, so situated that their time-differences from Greenwich, England, are an exact number of hours, or, in a few cases, half-hours. Greenwich, where the British Royal Observatory is situated, is thus made the fundamental point for calculating the world's standard time. All other places, instead of regulating affairs by their own respective "local" times, make use of the time belonging to the nearest one of the standard meridians just mentioned. As adjacent standard meridians differ in time by one hour only, it follows that the use of standard time instead of local time can never produce an error of more than half an hour, and as this error is perfectly constant, never changing throughout the day, it remains unnoticed in the practical affairs of life.

The advantage of this form of time reckoning is simple, but most important. The differences between the times in actual use in any two cities will be an exact number of hours, instead of a number of hours, minutes, and seconds corresponding to the real difference of local time. In passing from one city to another, therefore, a traveler can reset his watch by changing the hour only; he need pay no attention to the minutes. Having proceeded from New York to Chicago, for instance, he simply sets his watch one hour slow of New York time; he can reset the watch without the necessity of comparing it with any of the Chicago regulator clocks.

We have thus reminded the reader of the underlying principles governing standard time, in order to call attention to the following table showing the time procedure actually existing in various parts of the earth at the present date. The year 1901, as we have already said, has seen the addition of one more important nation to the list, Spain. France is the only important country still remaining outside the list; but there is some prospect of the necessary legislation being effected at Paris in 1902.

COUNTRY.	Hours Fast of Greenwich Time.	Adopted Since
Great Britain.....	0:	May, 1892
Belgium.....	0:	May, 1892
Holland.....	0:	Jan., 1901
Spain.....	0:	Apr., 1893
Germany.....	1:00	Apr., 1893
Italy.....	1:00	Nov., 1893
Denmark.....	1:00	Jan., 1894
Switzerland.....	1:00	June, 1894
Norway.....	1:00	Jan., 1895
Austrian railways.....	1:30	.....
Cape Colony.....	1:30	1892
Orange River Colony.....	1:30	1892
Transvaal.....	1:30	1892
Natal.....	2:00	Sept., 1895
Turkish railways.....	2:00	.....
Egypt.....	2:00	Oct., 1900
Western Australia.....	8:00	Feb., 1895
Japan.....	9:00	1896
South Australia.....	9:30	May, 1899
Victoria.....	10:00	Feb., 1895
New South Wales.....	10:00	Feb., 1895
Queensland.....	10:00	Feb., 1895
New Zealand.....	11:00	.....
United States, 4h, 5h, etc., slow of Greenwich time.....	.....	Nov., 1883

Structure of the Universe.—The observatory of Tashkent has published this year an elaborate memoir by Stratonoff, in which he discusses the distribution of the stars upon the sky. This subject had already been investigated by Seeliger, Kapteyn and others, and Stratonoff's results are based upon the same observational material used by the other investigators. The method consists in dividing the surface of the sky into a large number of small equal areas, and then counting the number of stars of various magnitudes contained in each such area. These counts are not made on the sky itself, but by an examination of the more extensive existing star catalogues. Stratonoff used the Bonn catalogue of Argelander. We have not space to do more than state his general conclusions, which he has embodied in a series of charts, showing, by means of shading, the stellar density (or number stars to the square degree) in different parts of the sky. He finds that the lines of maximum density do not follow the Milky Way exactly, nor is the pole of the Galaxy the point of minimum star density. He concludes that the Milky Way is composed of a large number of close star-clusters lying side by side in space.

The Stereo-comparator.—The astronomers' armory has been strengthened this year by the addition of a new and probably powerful instrument of research, the Stereo-comparator. This instrument resembles in appearance the ordinary stereoscope intended to exhibit pictures of solid objects correctly; that is, to make them look solid instead of flat, as they do in the usual photographs. Ordinarily, solid objects look solid because they are examined with both eyes; and the short distance between the two eyes of an observer acts as a sort of base line, by means of which we can estimate, to some extent, how much nearer one side of an object is than the other. If a couple of photographs are made in a similar way with a camera provided with two lenses so adjusted that the distance between them is approximately equal to the distance between a man's eyes; and if these two photographs are examined simultaneously in an ordinary stereoscope, the observer will see a single picture, and that picture will look solid, like the object itself if examined without any instrument whatever.

Astronomers have hitherto applied these principles in photographing the heavens with but slight success; Rutherford and others have, indeed, been able to make stereographs of the moon, by taking advantage of its libration. Pairs of photographs have been secured by them, which make the moon appear solid and round when examined in the stereoscope. In other words, the changing libration of the moon was made to take the place of the base line equal to the distance between a man's eyes. Still we have never had, until the present, a satisfactory stereoscopic instrument for comparing photographs, and the reason has been an optical one, the impossibility of making lenses which would satisfy the conditions of the problem. In November, 1901, Professor Max Wolf, of Heidelberg, published an article in which he describes a new instrument which can do the work. It was designed by Dr. Pulfrich, whose success was due to the use of the modern Jena glass. With this instrument it is possible to compare two astronomical negatives, just as a pair of terrestrial photographs are examined in an ordinary stereoscope. The new instrument consists of a couple of microscopes and plate holders, so arranged that two plates can be mounted so as to admit of being adjusted separately to the proper positions for examination, and then moved simultaneously under the microscopes, until any desired part of the negatives may be brought under observation.

The first use of this instrument by Professor Wolf gave most astonishing results. Special photographs of the planets Saturn and Jupiter were made in pairs, allowing time for the planets to move slightly between the two exposures. When examined in the new instrument such a pair of plates shows the beautiful planet surrounded with his moons and apparently hung in space at an immense distance this side of the fixed stars. The latter seem to be set upon the background of an infinitely distant sky, and the planet appears where it really is, somewhere in space between us and the stars.

So far, the instrument is interesting only as giving us new and more beautiful pictures of the heavenly bodies, but it has a far more important use than this. The fixed stars are not in reality absolutely fixed in space, but many are subject to what astronomers call a proper motion of their own; that is to say, they are moving on the sky very slowly, but, nevertheless, enough to become appreciable after a long lapse of time. In the case of a few, this motion is known to be much greater than it is with the generality of stars; and it has always been an important problem of sidereal astronomy to ascertain which stars are thus moving with relative rapidity among their fellows. The old method of studying this question was to compare the positions of stars on the sky as shown in ancient star catalogues, with those now determined by the larger instruments of modern observatories. This is a slow, laborious process, involving a vast amount of observing, and intricate calculations for the reduction of the observations, so as to make them available for the comparison. Astronomical photography has done much to diminish this, since we can now

observe proper motion stars, by comparing their positions as measured on photographs taken at wide intervals of time. But even this process is laborious, though far superior to the older one. It is necessary to measure the photographs with great precision under the microscope; and the measurements are not directly available for comparison, but must first be treated by lengthy processes of calculation.

The new instrument will probably offer a means of thus comparing photographs just as they come from the astronomical camera. If made at a considerable time interval, the two photographs, when placed in the instrument, will appear but as a single picture, so far as concerns the stars whose motions have been either *nil*, or at least so small as to be inappreciable. But if there is a star anywhere on the plate which has moved decidedly more than the generality of stars, it will appear in the stereo-comparator standing out from among the others and apparently hung in space between them and the background of the sky, just as we have described in the cases of Jupiter and Saturn. Thus a mere glance at such a pair of photographs must call attention to stars undergoing large proper motions; and the observational processes of the observatories can then be directed to those special stars, rather than to a great mass of miscellaneous ones. A similar use of the new instrument will, of course, assist in the discovery of new asteroids; and thus several of the most laborious tasks hitherto imposed upon astronomers will be made extraordinarily easy.

When we come to a study of the nebulae, the powers of the new instrument promise even more. It will, of course, show us pictures of these objects far more beautiful than we have ever had, and approximating to the beauty of the objects themselves when seen through the telescope with the eye. But in addition to this, it will also aid materially in their measurement. One of the great difficulties in cataloguing the smaller nebulae arises from their great number. Photographs have been made which exhibit as many as a thousand separate nebulae on a single plate. When the astronomer endeavors to make a catalogue of so vast a number of faint objects, it is very difficult to make certain that the catalogue is complete, that no individual nebula has been passed over; and, on the other hand, it is equally difficult to make certain that no object has been entered as a nebula which is due in fact to some imperfection of the photograph and not to a real object existing in the sky. Owing to this latter difficulty it is necessary to identify and measure the position of each nebula on two plates at least before entering it in the catalogue. Now with the new instrument it is possible to examine both plates at once. When they have been suitably adjusted the observer can tell at a glance whether the given object appears on both plates, and is, therefore, real, or whether it is on one plate only, and therefore, probably a mere photographic imperfection. It is simply necessary for the observer, with one eye at each of the microscopes of the instrument, alternately to close one eye and open the other, in order to decide as to the reality of any very faint object.

The instrument has a peculiar characteristic of the ordinary stereoscope, which becomes most valuable in astronomy, though it is a species of defect in the terrestrial stereoscope. If the two photographs are not exactly alike, the observer is at once made aware of that fact by a disagreeable impression produced upon his eyes. Photographs for the ordinary stereoscope must therefore be made with special pains to have them precisely alike, and it is for this reason that they are taken simultaneously with a camera having two separate lenses, rather than at different times with the ordinary one-lens camera. This peculiarity of the instrument helps astronomers, because they are ever on the watch for changes in the sky, no matter how slight. If an astronomer has two photographs made at different times, an instrument which will enable him to detect at a glance the slightest difference between these two photographs, becomes of great importance. For instance, new variable stars can be discovered with ease. Instead of laboriously estimating magnitudes on a series of photographs, and then comparing these magnitudes with those entered in catalogues, the plates can be compared directly, and if any star has a different degree of brilliancy on any two plates, that fact will become apparent at once.

Even stellar distances from the earth may be discoverable in this way. Astronomers estimate the distances of the fixed stars by the measurement of so-called parallaxes; that is to say, the exact position on the sky of a given star is determined twice, at intervals of six months. During that time the earth has revolved half way around its annual orbit about the sun and has changed its position in space by twice the radius of its orbit, or 185 million miles. The effect of this change in the observer's position is to change the direction in which he sees any given star, if that star be within measurable distance of the earth; and this change of direction will change slightly its apparent position on the sky.

It so happens that nearly all the fixed stars are so far away that even the immense base-line of 185 million miles is too small to alter their apparent directions by a measurable amount. Still, in a few cases, the determination of distance is possible, and there may be two or three stars very much nearer to us than any of the others,

and these two or three have perhaps not yet been examined for parallax. The reason for this must be sought in the present laborious nature of a stellar parallax investigation. What is needed is a wholesale method, making possible a rapid study of the distances of a great many stars. This the new instrument promises to provide, because it is merely necessary to compare with it a couple of photographs made six months apart. If there exists the slightest parallactic displacement of any particular star among the others, caused by the six months' change of position of the earth, that star will reveal its presence at once by producing the disagreeable effect upon the eye to which we have referred. As yet Professor Wolf has examined only a few photographs of the Pleiades group in this way; and he calls attention to a couple of stars lying near the group, which he now suspects may be within measurable distance of us. The Pleiades, stars themselves, he says, appear most distinctly in a single plane.

The New Planet Eros.—This is the important asteroid discovered by Witt, of Berlin, in 1898. It may be remembered that this body pursues an orbit passing within that of Mars, and that it can approach the earth nearer than any other permanent member of the solar system, except, of course, our own moon. This remarkable peculiarity is extremely favorable to an exact determination of the distance separating us from the planet; for when a celestial body is very near us, comparatively speaking, astronomical measures make possible a more accurate computation of its distance than is possible in the case of a more distant object. Astronomers call the problem of determining distance from the earth the parallax problem, though parallax, as understood by them, is not a synonymous term with distance. Without entering into details of too technical a character, it will be sufficient to call attention to the fact, that by the aid of Newton's law of gravitation it is possible to calculate from measurements of the planetary parallax a numerical value for the solar parallax. Thus, from observations of the planet we can obtain a solution of the problem of the sun's distance from our earth. This distance is the fundamental unit for linear measures in cosmic space, and its accurate numerical evaluation has always been regarded as fundamentally the most important problem within the entire range of astronomical research. Hence the extraordinary interest of astronomers in the new planet, and the remarkable activity in its observation during the latter part of 1900 and beginning of 1901. This was a particularly favorable period to observe it with precision, and, therefore, one especially favorable also for diminishing the uncertainty still existing in our knowledge of the distance from earth to sun.

General supervision of the Eros observations has been assumed by a sub-committee of the general international committee having in charge the great photographic survey of the sidereal heavens; and a number of circulars have been published, containing directions to be followed by observers and summarizing the results obtained. In this way it will be possible to introduce some sort of uniformity into the plans for observation and computation, and thus render the final results more satisfactory. It has not yet been possible to proceed to the determination of the solar parallax, because a vast amount of preliminary computational work must first be put out of the way. This work relates to the direct preliminary reduction of the planetary observations. But the committee has been able to go far enough to report that an amount of observation material has been gathered, satisfactory both as to quantity and quality; and we may look forward within a couple of years to a new definitive calculation of the sun's distance.

One other peculiarity of interest has been discovered in connection with Eros. In the spring of 1901 it was announced that Oppolzer of Potsdam had found the light received from Eros to be decidedly variable in amount; and this remarkable observation has been fully verified by other observers. The only plausible explanation of this phenomenon supposes the planet to be in rotation, and that it has different degrees of luminosity or reflecting power on opposite sides, or else is composed of two bodies that mutually eclipse during their rotations, after the manner of certain variable stars. Doubtless one of these explanations will be ultimately found to be correct; and if so, we have here still another novelty of great interest in connection with this new planet.

Distance of Faint Stars.—The Observatory of Yale University has been engaged for many years in the measurement of stellar distances from the earth. This is one of the most difficult problems of astronomy; for even the nearest of the fixed stars is so extremely far from us that the observational determination of its distance almost eludes the powers even of the most delicate instruments of precise measurement. Moreover, the process of measurement is a very laborious and time-consuming one; so that it has been applied to a small number of stars only. When selecting an object for the experiment, astronomers are guided usually by one of two considerations; either they take a very bright star in the hope that great brilliancy indicates at least comparative proximity, or else they take a star of large

so-called "proper motion." To understand why this last condition is probably an indication of nearness or space, it is merely necessary to remember that the "fixed" stars are not really unmoving in the exact sense of the word, but are subject to extremely minute progressive displacements on the face of the sky. These displacements are doubtless due to real motions of the stars in space; and it is easy to see that a given linear velocity of motion would appear relatively big to us if it occurred in the case of a star comparatively near. So if we select stars that have large apparent motions, and ascribe such apparently large motions to proximity rather than to actual speed, we may expect nearness, speaking comparatively, of course. In 1897 the Yale Observatory published determinations of stellar distances for all the brightest stars in the sky, so far as visible from New Haven. To these have now been added ninety-two new determinations of faint stars with large "proper motions." None of these stars was found to be especially near us, however, and so this last attack on the problem of sidereal distance, like all others so far made, has failed to reveal the existence of a real neighbor in cosmic space.

The Sun's Motion.—As the central governing body of the solar system, the sun, of course, appears as a vast immovable body with all the attendant planets circling round it. But regarded from the standpoint of cosmic sidereal astronomy, the sun is but an ordinary star, subject to the same laws and changes that affect other similar stars in space. We have had occasion several times to refer to the subject of stellar "proper motion," by which we mean slow progressive changes in the stars' positions on the sky, due to corresponding linear motions in space. Now, if our sun is a star, it is probably subject to just such a motion; and it has, in fact, been known for many years that such is actually the case. Herschel recognized that if the sun, drawing the attendant planets after him, is traveling through space, there must be a point on the sky towards which his motion is aimed; and there must be an opposite point also, from which such motion must seem to proceed. He called the first point the apex of solar motion, and the other the anti-apex. Now, it is at once evident that as we move towards the apex, the constellations near that point must appear to open out, and those near the anti-apex to close in. Herschel was able to show from a comparison of the stars' positions on the sky as contained in older star catalogues with those made in his day, that the position of the apex on the sky can be approximately determined, and that it lies in the constellation Hercules. About a score of other astronomers have made similar researches since Herschel's time, using, of course, the steadily accumulating observations of star-positions to render their results increasingly accurate. But they all agree, more or less, with Herschel's original examination of the question.

When a scientific fact has thus been established by a large number of investigators, all working more or less by the same method, it is considered most desirable that a verification be secured through the use of some new and entirely different method. Such a possibility was opened up by the discovery that it is possible to measure directly with the spectroscope the velocity with which any given star is approaching us in space, or receding from us, as the case may be. Of course, such a measurement always gives us the sum or difference of the motions belonging to the star under observation, and to the solar system itself. If we find, for instance, that a certain star is approaching at the rate of ten miles per second, we cannot distinguish directly whether this approach is due to our own motion, or to the star's. But if we measure a very large number of different stars, we may assume with safety that their respective motions of approach or recession will arrange themselves according to the laws of chance,—that they will, in the average, balance each other, and that their algebraic sum is therefore zero. During the present year Campbell has published a determination of the solar motion based on spectroscopic observations made at the Lick Observatory, using the foregoing assumption. He employed 280 stars, and it is most gratifying to find that his result for the apical position is in substantial agreement with that obtained from the older methods of observation.

Velocity of Alpha Persei.—A number of spectroscopic observations of this star were made public in 1901; and these are of great interest as illustrating the inherent difficulty of the so-called "line-of-sight" work, the great delicacy required of the observer, and the extreme care that must be taken to avoid accepting conclusions as real when they are doubtful or even erroneous. We have had occasion to refer several times to the possibility of measuring with the spectroscope the linear velocity in miles per second with which any given star is approaching the solar system or receding from it. According to the principle underlying this class of measurements, we shall, of course, if the star is approaching us, receive more light-waves in a second than we should get from a stationary source of light; and if it is receding, we shall receive fewer light-waves. We can easily compare the spectrum with one produced by a stationary source of light in the observatory, and from such a comparison can ascertain whether the star is coming or going, and with what rapidity.

Observations of this kind have led to some very remarkable results, quite worthy to rank among the most important discoveries thus far made.

Sometimes a star is found to have an unvarying velocity. No matter how frequently the observations are repeated the rate of approach or recession is the same, except that slight differences occur which can be reasonably ascribed to those small residual errors of observation that are never absent from conclusions drawn by the fallible human senses. A second class of stars have a velocity which varies in a regular period. At times the star is approaching, and again it is receding with a velocity as great as was its former rate of approach; and there will be intermediate observations showing it apparently stationary, neither coming nor going. Such a phenomenon can be explained only as the result of orbital rotation. The star must be revolving around some centre, and in the course of such revolution alternately approaching and receding, with intermediate periods when the motion is at right angles to our line of sight. At such times there would, of course, be no change in the distance separating us from the star, until its orbital revolution had again changed from a direction perpendicular to our line of sight. That we cannot see the central body about which such a star may be revolving does not at all prove that it cannot exist; space must contain many such "dark stars," quite massive enough to produce effective gravitational attractions, but not luminous enough to be seen.

A third class of "line-of-sight" stars exhibit double spectra, indicating duplicity in the light-source. Where the eye or telescope can distinguish but a single star, the spectroscope shows that there actually exists a double, with its components too near together to be separated visually even by the most powerful instruments. Such a case corresponds to the preceding one, with this difference: whereas, before, we had to deal with a case of orbital revolution where one body was luminous and the other non-luminous, we have now a stellar system in which both components are heated to a temperature capable of giving brilliant light. As might be expected, star spectra of this class also show periodic changes, enabling us to conclude that we are witnessing revolution in an orbit and to determine the nature of that orbit.

Alpha Persei was found to be a star of the second class, having a variable velocity of motion away from the solar system; and these results were published in December, 1900. At once confirmatory observations were attempted at Potsdam and at the Lick Observatory. But at neither institution were the observers able to verify the result that had been published. It appeared that the star in question is moving slowly, but always steadily in one direction. Campbell, of the Lick Observatory, ascribed the differences to some form of observational error; and called this one of the "cases illustrating the necessity and the difficulty of eliminating systematic errors from line-of-sight work." The case of Alpha Persei is not to be regarded as a loss to spectroscopic astronomy, but rather as a gain, for in science the highest precision has always risen Phoenix-like from the ashes of error.

Photography On Curved Plates.—In making astronomical photographs upon ordinary sensitive plates such as are supplied by the regular dealers in photographic supplies, a very definite limitation exists as to the size of the picture. It will be remembered that the telescope is used in astro-photography like an ordinary camera. The photographic object glass is at one end of the tube and the plate is attached to the other end. If such a camera-telescope is pointed at a star-group, and an exposure of suitable length made, the developed negatives will show star-images scattered here and there over its entire surface. Images will be formed quite near the edges of the plate, as well as at and near its middle point. But these images will not all be of equal excellence. Those within a certain distance of the centre will be round perfect dots, but those near the edges, and especially those in the corners, if the plate be square, will be far inferior. Instead of the exact circular dot, the images will be elongated in the direction of the plate-centre, and they will not be of equal blackness throughout the whole image. They show a sort of nucleus and a surrounding portion of lesser density. These defects are, of course, a great hindrance to exact measurement under the microscope; it is impossible to bisect such images quite accurately. The cause of these imperfections is to be sought in the photographic lens and its relation to the plate. Since the plate is a flat surface, or plane, it is not everywhere equally distant from the optical centre of the lens; the middle of the plate is necessarily a little nearer the lens than are the corners. Consequently, if we adjust the plate so that it will be in best focus for the centre, the outer parts of the plate will be distinctly out of focus. They are too far from the lens. To remedy this difficulty, Wadsworth, of the Allegheny Observatory, has been experimenting with curved plates, and he reports a considerable measure of success. It is merely necessary to use the interior surface of a hollow spherical shell, in order to have all parts of the sensitive surface equally distant from the optical centre of the lens. This interior surface can be coated with the usual gelatine emulsion, and pictures can thus be made which have excellent star-images quite to the edges of the plate. This makes possible, of course, the photography of a much larger portion of

the sky's surface on a single plate,—a consideration of no small importance from a theoretical point of view. It now remains to be investigated whether the measurement of such plates under the microscope will bring out any new difficulties, or whether they will admit of being measured just as accurately and easily as the old flat plates. There does not seem to be any reason to anticipate special difficulties of this order, and thus it is extremely probable that we have here a further advance in astronomical methods of photographic observation.

Planetoids.—The following minor planets have been officially added to the list since No. 456, the last one mentioned in the *Year Book* for 1900:

Number.	Temporary Designation.	Date of Discovery.	Discoverer.	Name.
457	FJ	1900 Sept. 15	Wolf.	Alleghenia
458	FK	Sept. 21	"	
459	FM	Oct. 22	"	
460	FN	Oct. 22	"	
461	FP	Oct. 22	"	
462	FQ	Oct. 22	"	
463	FS	Oct. 31	"	
464	FV	1901 Jan. 9	"	
465	FW	Jan. 13	"	
466	FX	Jan. 17	"	
467	FY	Jan. 18	"	
468	FZ	Jan. 18	"	
469	GB	Feb. 15	"	

Comets.—Only two comets appeared during 1901. The second of these was merely a reappearance of Encke's comet, and attracted but little attention. The first, however, which was also the first comet of the twentieth century, was visible to the naked eye. It was first seen on April 23, by Halls, of Queenstown, Cape Colony (though several other persons saw it on about the same date), and had at that time a triple tail 10° long. It was not observed in the northern hemisphere, except at the Lick Observatory. The tail reached its greatest length of 30° very early in May, after which this interesting object gradually diminished until it faded out some time in August.

ASYLUMS FOR INSANE. See **INSANITY.**

ATHLETES. See **TOBACCO.**

ATHLETICS, TRACK AND FIELD. Several American athletes of note visited England during the season of 1901 and at the English National Amateur Athletic Union championships at Huddersfield captured five events. A. F. Duffy, of Georgetown, won the 100 yds. in 10s.; Kraenzlein, University of Pennsylvania, the 120 yds. hurdles in 15 3-5s.; I. K. Baxter, Pennsylvania, the high jump with 6 ft. 1 in.; and W. W. Coe, Princeton, the shot put with 45 ft. 5½ in.; at Stamford Bridge, London, June 29, Kraenzlein did the hurdles in 15 2-5s., breaking the English record. During September an Oxford-Cambridge team came to the United States, playing first against a Canadian team of university men, whom they easily defeated, and meeting a Yale-Harvard team at Berkeley Oval, New York, on September 25. The American collegians retrieved their defeat of 1899 in London by winning 6 out of 9 events, the Englishmen, as usual, excelling in the longer distances. The summaries: 100-yd. dash, N. H. Hargrave, Y., 0.10 2-5 (the men ran 105 yds. by mistake); 440-yd. run, E. C. Rust, H., 0.50; half-mile run, Rev. H. W. Workman, C., 1.55 3-5; one-mile run, F. G. Cockshott, C., 4.26 1-5; two-mile run, Rev. H. W. Workman, C., 9.50; 120-yd. hurdles, J. S. Converse, H., 0.15 3-5; high jump, J. S. Spraker, Y., 6.01½; running broad jump, J. S. Spraker, Y., 22.04; 16-pound hammer, W. A. Boal, H., 136.08.

The 26th annual games of the Intercollegiate Association of Amateur Athletes of America were held May 25, 1901, on Berkeley Oval, New York. The weather conditions were unfavorable; continuous rains had covered the track with water and rendered valueless any comparison of results with former performances. First place counted 5 points, second place 3, third place 2, and fourth place 1. Harvard won with 44 points; second, Yale, 30 5-6; third, Princeton, 16 1-5, and fourth, Cornell, 15. Other teams were Georgetown, 10 points; Michigan, 6 2-3; Pennsylvania, 5 5-6; New York and Columbia, 5 each; Bowdoin, 4; Syracuse, 1. The championships have now been won by Harvard 11 times, Yale 6, Pennsylvania 4, Columbia 3, and by Princeton once. The present cup, which goes to the College winning it the most times in 14 years, has now been won four times each by Harvard, Yale and Pennsylvania. James E. Sullivan, president of the Amateur Athletic Union, succeeded as referee the late W. B. Curtis, who had held the office for about 20 years.

Summaries: 100 yards, A. F. Duffy, Georgetown, 0.10 1-5; 220 yds., F. M. Sears, Cornell, 0.22 3-5; 440 yds., W. T. Holland, Georgetown, 0.51 3-5; half-mile, J. M. Perry, Princeton, 2.03 3-5; one mile, H. B. Clark, Harvard, 4.31 1-5; two miles, B. A. Gallagher, Cornell, 10.00; 120-yd. hurdles, E. J. Clapp, Yale, 0.16 1-5; 220-yd. hurdles, E. J. Clapp, Yale, 0.25 2-5; pole vault, Deakin, Pennsylvania, Dvorak and Fisheigh, Michigan, Hood, Hale, Coleman and Moore, Princeton (points divided), 10.09; 16-lb. shot, R. Sheldon, Yale, 40.09¼; 16-pound hammer, J. R. De Witt, Princeton, 149.04½; high jump, S. S. Jones, New York University, 5.09½; broad jump, C. V. Kennedy, Columbia, 21.06 3-5.

In the Middle West eight of the leading colleges, namely, Chicago, Illinois, Indiana, Iowa, Michigan, Minnesota, Northwestern, and Perdue, decided to meet under their own rules, in an association to be called the Conference Intercollegiate Athletic Association. The other colleges of the old W. I. A. A.—Notre Dame, Drake, Grinnell, Illinois, and Knox—were invited to participate in the meet, but they were not allowed representation in its management. They met under the name of the old Western intercollegiate body.

At the Conference meet, held at Chicago on June 1, the Western intercollegiate record for 440 yds. was reduced to 49 2-5s. and the 220-yd. hurdles to 25 2-5s. Michigan won with 38 points, followed by Wisconsin, 20; Chicago, 17; and Minnesota, 14. On the same day the smaller colleges before mentioned held their meet, in which the Western shot-putting record was raised to 40.05½.

The 15th annual games of the New England Intercollegiate Athletic Association, held May 18, were won by Williams, 32 1-6, followed by Amherst, 32; Dartmouth and Brown, each 19 1-6; Bowdoin, 18 1-6; Massachusetts Institute of Technology, 8 1-3, and Wesleyan, 6. The New England 100 yds. record, 10s., was equaled, and the broad jump record placed at 22.04. Among other dual meets, Yale beat Harvard, 57 to 47; Cornell beat Princeton, 64 to 40; Pennsylvania beat Columbia, 88 to 55; and Princeton beat Columbia, 64½ to 39½. Pennsylvania met Columbia for the first time and won, 88 to 55. On the Pacific coast, California beat Stanford, 85 to 32.

At the Pan-American Exposition national amateur championships, held at Buffalo, June 15, the world's record of 9.4-5s. for 100 yds. was equaled by Sears, of Cornell, who also won the 220 yds. in 22s. The A. A. U. all-around championships, held at the Stadium, July 4, were won by A. B. Gunn, Buffalo Y. M. C. A., with 5,739 points. The Y. M. C. A. Athletic League championships, at the Stadium in June, were won by Chicago, 42 points; second, Buffalo, 20 points. At the annual relay races given by the University of Pennsylvania, Yale won the one-mile event in 3.27 1-5, second Chicago, third Syracuse, fourth Pennsylvania; Harvard the 2-mile in 8.14, followed by Columbia, Pennsylvania, Yale, and Cornell; and the 4-mile in 18.45 2-5, followed by Pennsylvania and Cornell. The sixth annual "Marathon run," held by the Boston A. A., was won by John Caffrey, Hamilton, Ont., who reduced the record by 10m. to 2h. 29m. 23 3-5s., the distance being 24 miles 1,478.4 yds. A contestant came from Sparta, Greece, for this race, but was badly defeated. The next world's Olympian games will be held at Chicago in 1904.

At the "Open Championships of the World" held by the A. A. U. at Buffalo, September 8, the following were the events and winners: 110 yds., W. D. Eaton, Somerville, Mass., 11 2-5s.; shot-put, R. Sheldon, 46 ft. 2½ in.; 120-yds. hurdle, H. Arnold, New York, 15.4-5s.; half-mile run, A. Grant, University of Pennsylvania, 2m. 1 3-5s.; hammer throw, J. Flanagan, New York, 171 ft. 1 in.; quarter-mile hurdle race, H. Arnold, 56 1-5s.; standing high jump, R. C. Ewry, New York, 5 ft. 5¼ in.; running high jump, G. P. Serviss, New York, 6 ft. 3 in.; pole vault, A. Anderson, New York, 11 ft. 3¾ in.; 2-mile steeplechase, G. W. Orton, Philadelphia, 11m. 58s.; 8-mile cross country, Pastime A. C. team, 43m. 27 1-5s.

At Paterson, N. J., September 1, M. J. Sheridan (Pastime) threw the regulation 4¼-lb. discus 120 ft. 7¾ in. At Long Island City, September 2, John Flanagan threw the 16-lb. hammer from a 7-foot circle 171 ft. 9 inches. In Canada, at the championship games, September 21, there were fewer American contestants than usual; the performances were moderate; only one Canadian record was made, that of the pole vault, which was shifted up to 11 ft. 2 in.

The need of the establishment of athletic rules common to all the eastern colleges was emphasized on many occasions during 1901. In the Middle West there is an annual conference on the subject.

ATOMIC WEIGHTS. See CHEMISTRY.

AUDRAN, EDMOND, French composer, died in Paris, August 18, 1901. He was born at Lyons, France, April 11, 1842, and studied first in the Niedemeyer School, entering in 1856. While there he received a number of prizes for composition, and later (1861) went to Marseilles as choir master in St. Joseph's Church. M. Audran wrote, while at Marseilles, several comic operas, including *La Chercheuse d'Esprit*

(1864), *La Nivernaise* (1866), and *Le Petit Poucet* (1868). In 1881 he went to Paris, and while there composed light operas in collaboration with the librettists Chivol and Duru. With them he produced *La Mascotte*, his greatest success (1881), *La Dormeuse Eveillée* (1883), *Le Grand Mogul* (1884), and others. He wrote the music for M. Roucheron's operetta, *Miss Helyett* (1890), and produced one mass in 1873, which was sung both at Marseilles and at Paris.

AUSTRALIA, COMMONWEALTH OF. A British colonial possession comprising the five States of New South Wales, Victoria, Queensland, South Australia, and Western Australia, forming the mainland of Australia, and the island State of Tasmania.

Area and Population.—The total estimated area, including Tasmania, is 2,973,076 square miles. The population in 1891 was reported at 3,183,237, and in 1901 at 3,777,212, distributed as follows: New South Wales, 1,132,234 and 1,362,232; Victoria, 1,140,405 and 1,195,874; Queensland, 393,718 and 502,892; South Australia, 320,431 and 362,595; Western Australia, 49,782 and 182,553; Tasmania, 146,667 and 171,066. Thus for the last decade the population of Australia has increased by 593,975, or less than 19 per cent., the smallest relative increase for the last four decades, during which the population increased as follows: 1861-71, 512,279; 1871-81, 586,697; 1881-91, 930,620; and 1891-1901, 593,975. The insignificance of the increase for the period of 1891-1901 becomes still more apparent when the fact is considered that the excess of births over deaths during the decade was 588,647, which leaves only 5,328 for the increase from immigration, while during the preceding three decades the increase from immigration was 176,814, 194,709, and 393,750 respectively. The immigrants of the last decade consisted mostly of colored persons.

Government and Finance.—In accordance with the constitution adopted in 1900 the six states of New South Wales, Victoria, South Australia, Queensland, Tasmania, and Western Australia form a federal commonwealth under the crown of Great Britain. At the head of the administration is a governor-general appointed by the king, and assisted by an executive council of seven members formed by a leader of the dominant political party from among the members of both houses of Parliament. The latter body consists of a Senate and a House of Representatives. The Senate numbers 36 members (6 from each state) elected by popular vote for a period of six years. The House consists of 75 members elected in the following proportion: New South Wales, 26; Victoria, 23; Queensland, 9; South Australia, 7; Tasmania, 5; and Western Australia, 5. The members of the House are elected in the same way as the members of the Senate, and the qualifications for membership are the same in both houses. Parliament must meet not less than once a year and is convened and dissolved by the governor-general. The legislative powers of Parliament are very comprehensive, embracing, besides the ordinary affairs of state, the control of foreign corporations formed within the limits of the commonwealth, the acquisition and extension of railways, the enacting of laws affecting family relations, and the settlement of industrial disputes. The powers of the Senate are equal with those of the House, except in the case of financial legislation, which can neither originate nor be amended in the Senate. Every measure passed by both houses of Parliament must receive the approval of the governor-general in order to become law, and even then may be annulled by the king within a year after the governor-general's assent. The judicial authority of the commonwealth is vested in the federal supreme court, called the High Court of Australia, and other federal courts. Justices of the High Court are appointed by the governor-general and removed at his discretion. The function of the High Court is to determine appeals from other federal courts, from the Supreme Court of any state, or from any other court of any state from which an appeal had to be made to the King in Council at the establishment of the federation. No appeal from a decision affecting the limits *inter se* of the constitutional powers of the commonwealth or of any one or more states can be made to the King in Council unless approved by the High Court. According to the provisions of the constitution, uniform duties are to be established for the entire commonwealth two years after the establishment of the federation (1903), and from that date the granting of bounties on production or exportation of goods is to be determined by the federal government exclusively, except in the case of bounties on gold, silver, and other metals. Interstate free trade exists since the establishment of the federation, but countervailing duties are paid on all goods imported before the establishment of a uniform tariff. For ten years after the establishment of the federation the federal expenditures must not exceed one-fourth of the revenue derived from customs and excise, and the remainder is to be returned to the states or used for the payment of debts taken over by the federal government. According to the statement of Sir George Turner, the federal treasurer, the commonwealth revenue from customs and excise will amount under ordinary circumstances to about £8,950,000. In 1901 the revenue from these sources was estimated at £8,000,000, and from postal and defense service, at £2,330,750. The expenditure was estimated at £3,024,-

106, leaving a balance of £6,305,644 to be returned to the states. The expenditure for the same year on account of the federation was £205,000.

HISTORY.

The Inauguration of the Commonwealth.—The new commonwealth of Australia came into existence on the first day of January, 1901, on which date Lord Hopetoun (*q.v.*), the new governor-general, was inaugurated at Sydney, New South Wales, and the first federal ministry assumed the reins of government. Lord Hopetoun, upon his arrival in Australia in December, 1900, had asked Sir William Lyne, the premier of New South Wales, to form the first cabinet. Sir William consulted with the premiers of the other states and found that Sir George Turner, of Victoria, and Mr. Holder, of South Australia, would join a ministry only under Mr. Edmund P. Barton (*q.v.*), the "father of the Commonwealth Bill." Thereupon Sir William Lyne advised Lord Hopetoun to send for Mr. Barton, who consented to form a ministry. Mr. Barton distributed his portfolios as follows: Prime minister and minister for external affairs, Rt. Hon. E. P. Barton, New South Wales; attorney-general, Mr. Alfred Deakin, Victoria; minister for home affairs, Sir William Lyne, New South Wales; treasurer, Sir George Turner, Victoria; minister of trade and commerce, Mr. Charles C. Kingston, South Australia; minister of defense, Sir James Dickson, Queensland; postmaster-general, Sir John Forrest, Western Australia. Sir James Dickson died a few days after his appointment and Sir John Forrest was appointed his successor, he in turn being succeeded as postmaster-general by Mr. James J. Drake, of Queensland. On complaint of Tasmania that it was not represented, Mr. N. C. Lewis, the Tasmanian premier, was added as a member without portfolio, but in April he was succeeded by Sir C. O. Fysh. Thus constituted the cabinet remained throughout the year. No exact classification of the cabinet as to political affiliations is possible, but a majority of the members were protectionists. On January 17 Mr. Barton outlined the policy of the ministry as to legislation. He said they would favor a protective tariff, with reciprocity with Great Britain if possible, and bills for conciliation and arbitration of labor disputes, a transcontinental railway, woman's suffrage, and Asiatic exclusion.

The Elections: Political Parties.—On Mr. Barton's statement of policy as a platform, the ministry entered the campaign for the first federal elections, which were held on March 30. The result, which turned principally on the tariff question, was a victory for the government, although in some of the states party lines were scarcely recognized, and a majority of the members from Queensland, where the sole issue was the Kanaka labor question, could not be classified. It was admitted, however, that the government's declared protective policy would be supported even by some who were not avowed protectionists, and that the ministry had a good working majority for carrying out its programme. Before the end of the year the Labor party, aggregating only 27 members in both houses, proved itself to be the best organized party in the federal Parliament. Throughout the session it practically held the balance of power, and kept both Mr. Barton and Mr. Reid, the leader of the opposition, bidding for its votes. Its members could generally be counted upon by the government whenever the latter was willing to give a suitable *quid pro quo*. This bargaining aroused considerable criticism, the Queensland government charging, for instance, that the sugar industry in that state had been sacrificed to the Labor party's demand for the abolition of Kanaka labor. Besides the passage of this bill the Labor party secured very considerable reductions in the tariff schedule, as presented in the ministry's bill.

Legislation: Federal Defense.—The first session of the federal Parliament was opened in the Exposition Building at Melbourne on May 9, 1901, by the Duke of Cornwall. Hon. Frederic W. Holder, a strong supporter of the government and an avowed protectionist, was chosen speaker of the House of Representatives. The legislative programme was practically the same as that upon which the campaign had been fought. The early months of the session were taken up with discussions of bills providing for the administration of the federal business. The federal defense bill, which was heralded by the French press as the beginning of militarism among Anglo-Saxon peoples, was introduced in June. It practically provides for conscription, though in a disguised and contingent form. Every male between the ages of 18 and 60 is liable to military service. Ordinarily the force will be raised by voluntary enlistment. Mr. Barton explained to the House that it was not intended to create a standing army or to provide anything of the nature of continental conscription, but that it was simply intended to demonstrate to Australia itself and to the world what Australia "could do in an emergency." In proof of which it was shown that while the existing defense forces of Australia numbered 62,000, under the new bill the number available for defense would amount to 974,000.

The "Black Labor" Question.—The first evidence of the growing hostility to "black labor" was seen during the debate over the postal regulations bill, when the Labor

party forced the government to accept an amendment prohibiting the employment of black labor on any steamship holding a contract for carrying Australian mails, a provision which, if enforced, would require the "P. & O." mail steamships to discharge all their lascar deck hands and Chinese cooks. With the introduction of the immigration restriction and Pacific islander bills in July the strength of the "White Australia" party was clearly shown. The immigration bill as originally introduced placed restrictions on immigration and provided for the removal of prohibited persons. The educational test was radical, prohibiting the landing of any person who could not write 50 English words dictated by an immigration officer. The Labor party proposed amendments prohibiting absolutely the immigration of native-born Asiatics or Africans and providing for the exclusion of any person who shall come to Australia under a contract of any sort. The first was defeated on Mr. Barton's informing the House that the imperial government would not assent to any law which made color or nationality a reason for exclusion. After it was pointed out that the contract-laborer amendment would exclude even an English clergyman appointed to an Australian bishopric, it was made to apply to manual labor only and the government accepted the amendment. After the restriction as to the English language had been changed to any European language, and the bill practically remodeled on the Natal law, it was passed early in December. The Pacific Islanders' Bill (see QUEENSLAND), which provided for the gradual abolition of all Kanaka and Polynesian labor, to be complete by the end of 1906, met violent opposition. It was passed against the advice of the imperial government, and in the face of opposition from the Queensland government, which declared that it was almost entirely a Queensland question, there not being 500 Pacific Islanders in Australia outside that State. The act was passed in December, and the Queensland ministry, declaring that the sacrifice of the Queensland sugar industry was the price paid by Premier Barton for the Labor vote in Parliament, asked the imperial government that the royal assent be withheld.

Tariff and Shipping Bills.—The tariff bill which was introduced by Mr. Kingston on October 8 was a protective measure with no discrimination in favor of Great Britain. The bill proposed to raise £9,000,000 as follows: £2,100,000 by customs and excise duties on stimulants and the remainder from port duties of three sorts, fixed, composite, and ad valorem. The duties averaged about 18.7 per cent., but in the case of composite duties ran up as high as 70 per cent. An elaborate system of bonuses was provided for, especially in aid of iron-smelting and machine shops. Mr. Reid led the opposition to the bill, bringing forward a motion of "no confidence"; this was lost on November 1 by a vote of 39 to 25. The government, however, was compelled to concede reductions to the Labor party, the general result being that by the end of the year, of 74 groups examined, 38 had been reduced, composite duties were entirely abandoned, and the estimated revenue-yielding power of the bill cut by £1,168,000. A shipping bill, which gave to a federal commission almost complete control, not only of interstate commerce, but of foreign vessels engaged in Australian trade, was introduced by the government, and criticised as likely to give offense to foreign powers.

Industrial Arbitration.—Early in December a federal industrial arbitration bill, on the lines of the New Zealand act, was passed by Parliament. It makes strikes illegal, and labor unions financially responsible for their acts. A court of arbitration is established, presided over by a judge of the federal supreme court, which has most of the powers exercised by the Victoria wages boards, but is likely to prove less partisan.

Other Events of the Year.—During 1901 there developed in the State parliaments a tendency to criticise the federal Parliament. In New South Wales bitter attacks were made upon it for extravagances and for alleged invasion of State rights. On all sides it was criticised for being slow, and the trouble was generally said to be that Mr. Barton had no driving power. The estimates of the cost of the federal administration, which were raised from £300,000 to £500,000, together with the fact that large "allowances" were being made federal officials, called forth comment. It was declared that the biggest thing the Parliament had done was "talking 10,000 pages of Hansard."

In June a parliamentary commission was appointed to inquire into the advisability of adopting the decimal system of coinage, and providing for a federal coinage on that basis. The federal commission appointed to select a site for the new capital city reported three sites in New South Wales: Orange, a town 150 miles northwest of Sydney; Bumbah, 100 miles due west of Sydney; and Yass, 200 miles southwest of Sydney. Late in the year a federal flag was adopted. The accepted design has the Union Jack in the upper left-hand corner, on a blue (or, for marine, red) body, with a six-pointed star emblematic of the six federated States immediately below it. The other half contains the "southern cross."

The financial outlook in the commonwealth is not bright. All the States have

for some years been borrowing too freely, spending loan money on matters which ought to be provided for out of the revenue, and the late loans have been floated only at a great cost for brokerage. For the year ending June, 1901, the six States had used up £7,500,000 borrowed money, and in 10 years had sent to London £70,000,000 in payment of interest. This situation will undoubtedly prove a handicap to the federal government when it enters the loan market, as it must do.

Australian Policy; Growth of a National Spirit.—The dominant note in the first year of the new commonwealth's history was "nationalization" as opposed to imperialism. In a dozen different ways this spirit has manifested itself. Most interesting perhaps has been the strength of the movement for Australia to build and maintain her own fleet, which has been opposed by the British Admiralty, who prefer naturally to have the commonwealth contribute money to the British naval estimates. One critic, Dr. Fitchett, an acknowledged imperialist, says: "It would be nothing less than disaster for the British Admiralty to commit itself to a policy which is in conflict with the national sentiment and truest interest of Australia."

In November, when the question of taking charge of the administration of (British) New Guinea (*q.v.*) was under discussion in Parliament, there was an illustration of the fact that the Australians are striking out for themselves along lines formerly considered as belonging wholly to the imperial government. During the debate, the federal Parliament affirmed, unanimously almost, its desire to formulate a "Monroe doctrine" for the Pacific, opposing the further expansion of European or Asiatic nations in the Pacific, which ought henceforth to be considered Australia's "back yard." As this policy, if adopted, would almost assuredly lead to trouble with Germany, it was brought forward as an additional reason for Australia's need of a fleet. The adoption of a policy as to alien immigration and labor directly opposed to the customary imperial policy and the spirit shown in the passage of the Pacific Islander bill, contrary to Mr. Chamberlain's advice, show a remarkable tendency toward independence in legislation. And a national coinage, a national flag, and national postage stamps are only less important manifestations of the same spirit. See NEW SOUTH WALES, QUEENSLAND, SOUTH AUSTRALIA, TASMANIA, VICTORIA, and WESTERN AUSTRALIA.

AUSTRIA-HUNGARY, a constitutional monarchy of central Europe comprising the empire of Austria and the kingdom of Hungary, united under one sovereign, Franz Josef I. The capital of Austria is Vienna and of Hungary Budapest; the Delegations, a legislative body common to both countries, convene each year in each of the capitals alternately.

Area and Population.—The monarchy has a total area of 240,942 square miles, of which Austria comprises 115,903 square miles, and Hungary (including Croatia and Slavonia, 16,773 square miles) 125,039 square miles. According to the census of December 31, 1890, the population of Austria was 23,895,413 and of Hungary 17,463,791—total, 41,359,204. The census of December 31, 1900, showed the population of Austria to be 26,107,304 and of Hungary 19,203,531—total, 45,310,835. According to the latter census the population of the principal Austrian provinces were: Galicia, 7,295,538; Bohemia, 6,318,280; Lower Austria, 3,086,382; Moravia, 2,435,081; Styria, 1,356,058; Tyrol and Vorarlberg, 979,878; Upper Austria, 809,918. The population of Hungary proper was 16,691,471; Croatia and Slavonia, 2,397,249; and the town of Fiume, 38,139. In addition the military numbered 114,393. The last census showed the population of the largest Austrian cities to be: Vienna, 1,648,335; Prague, 204,478; Trieste, 178,672; Lemberg, 159,618; Gratz, 138,370; Brünn, 108,944. The population of Budapest was 713,383.

Common Government and Finance.—The executive authority rests with Franz Josef, who became emperor of Austria in December, 1848, and king of Hungary in June, 1867. The heir presumptive is the Archduke Franz Ferdinand, son of the late Archduke Karl Ludwig, brother of Franz Josef. The present relations of Austria and Hungary date from the "compromise" of 1867, which is of indefinite duration and is based on similar clauses in the constitutions of the two states. Under this compromise the common administration is directed by the emperor-king, assisted by a ministry of three members, for foreign affairs, finance, and war, who are responsible to the common legislature called the Delegations. These are two in number, composed of sixty members each; the one convenes annually at Vienna and the other at Budapest. The composition of the common ministry in 1900 was: For foreign affairs, Count Agenor M. A. Goluchowski (since May, 1895); for finance, Benjamin de Kállay (since June, 1882); for war, General E. von Krieghammer (since September, 1893). The common government deals with foreign affairs, the army, the navy, finance relating to the monarchy as a whole, customs, certain state monopolies, and the diplomatic, postal, and telegraphic services. Pursuant to a reciprocity treaty concluded in 1899, when the customs union between Austria and Hungary was formally dissolved, the common expenses of the monarchy are borne in the proportion of 65.6 per cent. for Austria and 34.4 per cent. for Hungary, and

the status of practically common customs is continued, the provisions of the treaty to expire December 31, 1907.

The monetary standard is gold and the unit of value (since January 1, 1900) the krone (crown), worth 20.3 cents. The former unit of value, still in use to a large extent by the people, was the florin, worth two kronen. The estimated revenue and expenditure have balanced as follows: For 1900, 337,348,000 kronen; for 1901, 357,034,766 kronen; for 1902, 357,814,966 kronen. The estimated receipts from customs are: For 1900, 124,950,000 kronen; for 1901, 125,039,249 kronen; for 1902, 110,541,299 kronen. By far the largest expenditure is for war and marine, the estimate being 342,118,520 kronen for 1901 and 342,568,542 kronen for 1902.

Joint debts are not contracted by the dual monarchy. A debt, however, was assumed in common when the union was effected in 1867, and this in 1900 amounted to 5,438,989,758 kronen, the charges being 191,474,110 kronen for Austria and 60,621,206 kronen for Hungary. In addition there is a floating debt amounting in 1900 to 321,978,260 kronen, of which Austria's share was 24,285,800 kronen.

Army and Navy.—On a peace footing the strength of the Austro-Hungarian army in 1900 was reported as follows: The common army consisting of fifteen army corps had 20,780 officers and 283,513 men; the Austrian *Landwehr* comprised 2,601 officers and 25,068 men, and the Hungarian *Honvédség* 3,013 officers and 26,658 men; accordingly, the active army numbered 26,454 officers and 335,239 men—the total being 361,693. On a war footing the number of officers is placed at over 45,000 and of men at about 1,827,000—total, about 1,872,000. With the various reserves the total military strength on a war footing is estimated at over 4,000,000 men.

The navy though small is efficient, and a programme is now being carried out for replacing obsolescent vessels by new ones of modern construction and effectiveness. The fleet was reported to comprise in 1900 one second-class battleship, four third-class battleships, two armored cruisers, eight protected cruisers, seven port-defense vessels, twelve torpedo gunboats, thirty-two first-class torpedo boats, thirty-one second-class torpedo boats, and eight third-class torpedo boats.

The latest addition to the navy is the *Arpad*, an armored turret battleship, which was launched on September 11, 1901. A sister ship, the *Hapsburg*, was launched in September, 1900, and a third vessel of the same type, the *Babenberg*, has been laid down. Each of these has a displacement of 8,340 tons, exceeding by over 1,400 tons the *Erzherzog Rudolf*, which was previously the largest modern vessel of the fleet. Though of comparatively small tonnage the *Arpad* has a strong armament; the indicated horse-power is 11,000; maximum speed 18.5 knots; and its coal capacity 800 tons, allowing a voyage of 3,600 geographical miles.

Government and Finance of Austria.—The executive authority is vested in the emperor and the administration is carried on by a ministry of ten members appointed by the emperor and responsible to the legislative body, the *Reichsrath*. This body consists of an upper house (*Herrenhaus*) and a lower house (*Abgeordnetenhaus*), the members of the latter being elective. Austria has no separate ministry for foreign affairs. The premier and minister of the interior since January 21, 1900, has been Dr. Ernst von Koerber. Each province has a representative diet (*Landtag*), which deals with matters not reserved for the *Reichsrath*.

The revenue and expenditure in kronen (20.3 cents) have been estimated as follows, respectively: 1900, 1,585,811,822 and 1,586,403,933; 1901, 1,641,997,585 and 1,641,163,344; 1902, 1,685,966,357 and 1,685,117,944. The consolidated debt in 1900 amounting to 3,132,060,222 kronen and the floating debt 21,456,202 kronen—total, 3,153,516,424 kronen. Interest and amortization amounted to 152,555,874 kronen.

Government and Finance of Hungary.—The administration of Hungary, including Croatia and Slavonia, is directed by a ministry of 9 members appointed by the king and responsible to the legislative body, the *Reichstag* (*Országgyűlés*). This body is bicameral; the members of the lower house are elected by popular vote. Like Austria, Hungary has no separate ministry for foreign affairs. The premier and minister of the interior since February 26, 1899, has been Koloman de Szell. In addition to representation in the *Reichstag*, Croatia-Slavonia has a separate diet.

The estimated revenue and expenditure in kronen have been reported at 1,054,513,404 and 1,052,681,821 respectively for 1900 and 1,056,582,297 and 1,056,556,417 respectively for 1901. In 1899 the consolidated debt amounted to 2,178,066,000 kronen and the total debt 4,950,450,000 kronen.

Religion and Education.—Religious toleration prevails, but the emperor-king must be a member of the Roman Catholic Church; that church is the prevailing religious influence in both Austria and Hungary, but is stronger in the former. In both countries elementary education is free and compulsory. The pupils attending the elementary schools in 1899 numbered 3,483,646 in Austria and 3,231,739 in Hungary. There are numerous institutions for secondary, higher, and technical education—the *Gymnasien* and *Realschulen*, universities and colleges, and professional schools.

Industries.—The leading industry in both Austria and Hungary is agriculture.

The principal products are wheat, barley, oats, rye, corn, potatoes, and beets. Mining and furnace industries are important. In 1899 the reported values of mining and furnace products in Austria were 208,292,372 kronen and 94,997,716 kronen respectively; in Hungary, 57,383,000 kronen and 54,970,900 kronen respectively.

The annual production of coal in Austria is over 33,000,000 tons and in Hungary between 7,000,000 and 8,000,000 tons. The annual consumption, however, is about 60,000,000 tons, the deficit being made up by imports. Throughout the monarchy there are various factories for the production of metal wares, textiles, spirits, tobacco, sugar, and other manufactures. Although the commercial and industrial situation in the fall of 1901 was more unsatisfactory than it had been in years and many industrial establishments were reducing the number of employees or shortening the hours of labor, remarkable progress has been made of late in both commerce and manufacture. This progress, especially in Hungary, has been ascribed largely to the excellent system of technical and industrial schools that have been established or fostered by the government.

Hungary, which is usually regarded as a distinctively agricultural country, has been making conspicuous efforts during the last few years to establish manufacturing industries. From 1893 to 1900 inclusive 356 new industrial establishments, including almost every kind of manufacturing, were opened, the aggregate capital employed being some \$52,600,000. Nearly all of these enterprises received aid from the government, which proposes to continue the principle of subvention in order to encourage further the establishment of factories. It has been stated that Hungary wishes to attain such a degree of industrial independence that she may abrogate that clause of the *Ausgleich* which provides for the Austro-Hungarian customs union.

Commerce.—The special commerce of the customs territory, including Bosnia and Herzegovina (*q.v.*), has been as follows, the trade in specie and bullion being excluded: 1899, imports and exports, 1,608,800,000 kronen and 1,861,600,000 kronen respectively; 1900, imports and exports, 1,683,500,000 kronen and 1,911,900,000 kronen. In the latter year the imports and exports of raw materials amounted to 995,200,000 kronen and 810,700,000 kronen respectively; partly manufactured articles, 225,900,000 kronen and 292,300,000 kronen; manufactured articles, 462,400,000 kronen and 808,900,000 kronen. The import and export of bullion and specie in 1899 amounted to 43,100,000 kronen and 71,100,000 kronen respectively; in 1900, 44,900,000 kronen and 67,200,000 kronen. The values in kronen of the leading imports in 1900 were: Cotton, 151,400,000; wool, 99,300,000; coal, coke, etc., 89,800,000; tobacco, 60,500,000; machinery, 51,200,000. The leading exports in 1900 included: Wood, 252,100,000 kronen; sugar, 178,400,000; eggs, 90,000,000; lignite, 67,800,000; cattle, etc., 62,500,000; grain, 58,600,000; horses, 56,900,000; glass, 51,600,000; leather goods, 50,400,000; malt, 50,000,000. The trade with Germany in both imports and exports far exceeds that with any other country.

According to a United States consular report the countries exporting to Austria-Hungary in 1900 were, in the order of the amounts exported: Germany, the United States, Great Britain, Italy, Russia, British India, Switzerland, France, and Brazil. The fact that the United States stands second in the list may be misleading; for, while in 1900 Germany sent to Austria-Hungary goods valued at \$127,000,000, the import from the United States amounted to only \$30,600,000. The latter amount, however, is large in comparison to the Austro-Hungarian export to the United States, which in 1900 was valued at \$7,600,000. This state of affairs causes much dissatisfaction in Austria-Hungary and is a factor in the movement for a European customs union against the United States. Such a union was widely discussed in 1901 throughout central Europe, and Austrian manufacturers and agriculturists were making an organized effort to stop the increase of American imports. It was believed in some quarters that after the expiration of the Austro-Hungarian tariff treaties necessitating a general revision of the customs laws of the country, would be followed by the erection of tariffs aimed especially against American products. This anticipated action against the United States, however, may be modified both through fear of American tariff retaliation and through the realization that the prices of the necessities of life would advance. With regard to the proposed protective league, comprising Austria-Hungary, Germany, Switzerland, Belgium, and the Netherlands, against American importations, the American consul-general at Vienna, writing in October, 1901, said that such an attempt could not be seriously considered, notwithstanding the fact that the monarchy is threatened with an influx of American goods that "tend to dwarf, if not actually destroy, many Austro-Hungarian industries."

A meeting representing both manufacturing and agricultural interests, held in Vienna in October, 1901, made the following recommendations: A revision of the customs laws looking in general toward effectively protective tariffs; special reciprocity treaties instead of the "most favored nation" principle; only short-term commercial treaties with the United States and Argentina (the great grain producing

countries); an agreement among the countries of central Europe for mutual protection against the competition of both North and South America.

Communications.—At the beginning of 1900 there were 18,738 kilometres (11,643 miles) of railway in Austria, of which 7,584 kilometres (4,712 miles) were owned by the state. At the same time the Hungarian lines aggregated 16,951 kilometres (10,530 miles), of which 7,650 kilometres (4,754 miles) were owned by the state. Accordingly, the total length of railways in the monarchy was 35,689 kilometres (22,173 miles), of which the state owned 15,234 kilometres (9,466 miles). The state operated, in addition to its own lines, many miles of private railways. The river and canal mileage navigable for steamers has been reported at 818 in Austria and 1,923 in Hungary. (For the railway and canal systems projected in 1901, see the paragraphs on History.) In 1899 Austria had 6,065 post offices and 5,371 telegraph offices; the telegraph lines aggregated 33,235 miles and the wire 100,332 miles. In the same year the Hungarian post offices numbered 4,836 and the telegraph offices 3,165; the length of telegraph lines was 14,021 miles and of wire 69,791 miles. In 1899 the receipts of the posts and telegraphs in Austria-Hungary amounted to about 144,567,000 kronen and the expenses about 118,139,000 kronen.

HISTORY (a) *Austria.*

The year 1901 was important in Austrian politics, since it marked the resumption of legislative work on the part of the *Reichsrath* after four years of obstruction caused by the mutual antipathy of the Slav and German elements. So serious did the obstructionist methods become in the preceding year that a number of clerical leaders and members of the nobility asked for a suspension of constitutional government, while among the people discouragement and indifference were prevalent and the parliamentary broils called forth only contempt. The government disregarded the counsels for a *coup d'état*, but dissolved the *Reichsrath* on September 7, 1900.

The New Reichsrath.—At the end of 1900 elections for a new lower chamber of the *Reichsrath* were in progress and they ended on the 18th of January. This chamber may be roughly divided into the Right and the Left. The Right is composed of three principal elements: the Poles of Galicia, a powerful group, conservative and Slav; the Catholics, or Clericals, who though of German blood prefer to be allied to the Catholic and conservative Poles; finally, the Czechs of Bohemia, who are liberal rather than conservative, but who make the race question of prime importance. The Left, which includes most of the Germans of Austria, comprises several groups: the Liberals, whose influence is growing weaker and weaker; the Radicals; and the Pan-Germans, whose programme under Herr Schoenerer looks towards the annexation of Austria, with the exception of the province of Galicia, to the German Empire. It is between these two general parties, the Right and the Left, that the government has been obliged to manoeuvre, and usually with little success.

The result of the elections was a surprise to the reactionary parties; the Right suffered losses, while gains were made by radical nationalism. But over twenty political groups were represented, and it seemed impossible to bring about a stable majority. The election returns were as follows, the figures in parenthesis indicating the number of deputies in the preceding parliament: The German People's party, 49 (41); German Progressives, 35 (36); German Radicals, 21, (8); Christian Socialists, 21 (27); the Free German Union, 3 (9); the Catholic People's Party, 23 (27); Young Czechs, 53 (61); Agrarian Czechs, 6 (a new group); the Czech Labor party, 4 (a new group); Czech Clericals, 2 (1); Poles, 60 (55); the Polish People's party, 9 (8); Ruthenians, 11 (9); Slovenes, 16 (17); Croats, 9 (9); Serbes, 2 (2); Italians, 19 (15); Roumanians, 5 (5); Constitutional landed proprietors, 30 (28); Conservative landed proprietors, 19 (19); Party of the Centre, 6 (6); the Moderate Party, 3 (2); Social Democrats, 10 (15); independents, 9 (20). The success of the Pan-Germans (German Radicals) in increasing their representation from 8 to 21 is of much interest, for as soon as the party demanding the annexation of Austria to Germany becomes of considerable importance, a serious international question presents itself.

The new *Reichsrath* convened at Vienna on January 31, 1901. On February 4 the emperor addressed the two houses, setting forth a programme of extensive social, economic, and industrial reforms, and appealing to the members to abandon a racial strife that brought only evil on the state. He defended the constitution "which he had granted to his estates in the exercise of his free will." This expression seemed to indicate that the emperor might, if occasion demanded, "of his free will" suspend the constitution. His plea, however, for a reconciliation of racial animosities had little effect. From the moment when the premier in September, 1900, had taken the extreme measure of dissolving the *Reichsrath* in order to extricate himself from the almost hopeless situation then existing, there seemed to be little likelihood that

the new chamber would be much better than the old; and during the greater part of the sessions of 1901 such was the case. Disorderly scenes began almost with the opening of the chamber on January 31. On February 20 such violent and obstructive tactics, arising from the question as to whether interpellations on rulings from the chair should be accepted in other languages than German, were indulged in by the Pan-Germans and the Czech extremists that the president adjourned the sitting, while soon after personal conflicts occurred between the Germans and Czechs and strong anti-Catholic and anti-Clerical demonstrations took place. The anti-Catholic, or "Los von Rom." movement, provoked especially by alleged evils connected with the confessional, persisted during the year and called forth much bitter discussion both in the *Reichsrath* and among the people.

"*Federalism.*"—During 1901 the Germans and the Czechs, who for the most part were agreed upon a common sovereign and the unity of diplomatic, commercial, and military affairs, were still bitterly opposed on matters of administrative policy. Both party programmes were the outcome of the language question. Hitherto, when the government has attempted to maintain the privileges of the German language it has encountered the opposition of the Right, led by the Czechs, who resort to obstruction as a supreme argument. When on the other hand the government has shown an inclination to establish equality of rights between the two languages the Germans would adopt an almost intractable attitude. In a general way the policy of the Germans of the Left is for the maintenance of the *status quo*—that is, the centralist régime, which favors the hegemony of the German interests and the German language; while the policy of the Right looks toward "federalism," or central government representing autonomous states—a condition that would aid the Slavic element in overcoming the German hegemony. In the latter case each state would be governed by its own majority, and the strength of the central government, the Slavs held, would not be impaired. In support of their argument they pointed to the autonomous states of the German empire. The difficulties in the way of federalism have seemed insurmountable. The Slav lacks material force; the army is not with him, and it is not likely that any circumstances will arise which will place it on his side. The eastern half of the monarchy, Hungary, would strenuously oppose the principle of federalism in Austria. Moreover, in case a trial should be made, it seems that little would be gained; in the Slavic states the Germans would be humiliated and in the German states the Slavs; the racial struggle would go on as before, and perhaps more fiercely, since the contestants would be at closer quarters.

The Premier's Economic Programme.—An entente—provisional and temporary—between the jarring sects was brought about in 1901 by Dr. von Koerber, the premier. During 1900 he had in vain attempted to effect a reconciliation, but though it was necessary to raise revenues by ordinances and though finance and industry were seriously menaced, he had refused to abandon constitutional methods. With the new *Reichsrath* he continued his policy of "dispassionate perseverance" and again attempted reconciliation between the parties not on national and political grounds—that was impossible—but on economic grounds. The task was not easy, but through a series of conferences he brought about certain mutual concessions between the Czechs and Germans, and finally his important economic programme, which he had announced at the opening of the *Reichsrath* and which was made more attractive by reason of the existing commercial and industrial depression, was taken up for consideration by the parliament. The most important parts of this programme were the measures for railways and canals.

The railway project provided principally for the construction of a system of lines in the southern provinces, for the connection of the port of Trieste with the northern districts, and for a line connecting Bohemia, Moravia, Silesia, and Galicia. The authorized expenditure, to be raised by loans distributed over the period 1901-05, was about 487,038,000 kronen. The most expensive part of the project will be the establishment of the line ending at Trieste, which will be 485 kilometres long and will cost 134,978,000 kronen. Two lines, connecting the Dalmatian ports of Spalata and Gravosa, and Bosnia with the port of Cattaro, will be of great political importance.

For many years the coal districts of Bohemia and Moravia have desired the construction of canals in order to combat the monopoly of the existing railways, but such construction has been feared on account of the great expense involved. On April 26, 1901, Dr. von Koerber introduced a bill authorizing the construction of four canals in the districts of the Danube, Elbe, Moldau, and Vistula. The bill provides that the work be begun in 1904 and be completed within twenty years, and that the expense thereof be met by a four per cent. loan, issued between 1904 and 1912 to a maximum sum of 250,000,000 kronen and redeemable in 90 years. Expenses after 1912 will be met by additional legislation. The bill provided for the following canals: From the Danube to the Oder; from this canal eastward to the Vistula and the navigable portion of the Dniester; from the Danube-Oder canal westward to the upper Elbe (and the canalization thence of the Elbe as far as

Melnik); from the Danube to the Moldau, near Budweis (and the canalization of the Moldau from Budweis to Prague). The aggregate length of these canals is variously estimated at from 992 to 1,054 miles, and they are designed to admit boats up to 600 tons burden. The total cost, which including the expenditure subsequent to 1912, will probably reach 500,000,000 kronen, will be met by proportionate contributions from the provinces, districts and towns that will benefit through the canals, and by imperial subventions. If this plan is fully carried out there will be a network of canals covering the principal provinces and connecting the main navigable streams of Austria, which will afford cheap all-water routes to the Black and Baltic seas. The measure was opposed in the *Reichsrath* by the Agrarian elements on the same grounds that the German canalization schemes are opposed by the German Agrarians, namely, that by cheapened freight rates the canals would flood the country with foreign food products, especially grain and vegetables, to the very serious detriment of the Austrian farmers. On the other hand, and again as in Germany, the proposed canals have the thorough approval of the manufacturing and commercial interests. The force of the Agrarian position was emphasized, perhaps unconsciously, by the American consul-general at Vienna, who wrote: "It is to be hoped that with the completion of these waterways our American products can be more cheaply introduced into Austria-Hungary than at present." Although serious topographical difficulties must be overcome, and for a considerable time each year the canals will be closed by ice, it is thought that the project will pay. Many parts of the interior now practically inaccessible to extensive trade can be developed, while easier communication will be provided with Germany and Russia. On June 1, 1901, the canal bill, together with the railway bill, was enacted unanimously, the opponents having absented themselves.

Besides these two great projects, the *Reichsrath* enacted a number of important bills bearing upon social conditions. Among these were a measure providing for the reduction of the working day for miners from ten to nine hours, the abolition of certain burdensome customs duties, and the imposition of an excise on spirituous liquors. A provisional budget was voted, and also a large number of bills of secondary importance looking toward the improvement of local administration. The various measures adopted called for an increase of taxes, for it was plain that to vote a thousand million kronen for expenditure and not to increase the revenue, would bring about a serious deficit; it is feared that although the revenues increase year by year there will be recurring deficits in the budget.

Renewed Obstruction.—With the convening of the fall session of the *Reichsrath*, October 17, 1901, it was clear that the *rapprochement* between the nationalities, which had never been real except on economic grounds, had come to an end. On October 23 a violent debate took place between the Czechs and the Germans, and in November there was little or no prospect of reconciliation, while important legislation was being blocked. It seemed probable that the Czechs would not obstruct the debate on the budget for 1902, which showed estimated revenue and expenditure of 1,685,966,357 kronen and 1,685,117,944 kronen respectively, but no real amelioration of the existing antagonism was expected in the near future. The *Reichsrath* reached such a degree of inefficiency that on December 10, Dr. von Koerber, for the first time, referred to the possibility of a suspension of the constitution. But though there was much provocation at the close of the year for such suspension, the government apparently feared to resort to so extreme a measure, not only on account of the resulting disapproval in Austria, but because of the action that Hungary would probably take. According to the compromise on which the dual monarchy rests, Hungary is not bound to treat with Austria unless the latter is constitutionally governed.

The Heir Presumptive.—The action of the Archduke Franz Ferdinand, in assuming in the spring of 1901 the patronage of an association for promoting Catholic denominational education, called forth angry protests from the German parties in the *Reichsrath*. It is not customary for any member of the royal family, except the emperor, to take an active part in politics, and the action of the archduke was regarded by the Germans as political. The archduke was encouraged in his rôle of "militant churchman" by hismorganatic wife, who hopes, it is thought, in the event of ultimate Clerical victory in Austria-Hungary, to be absolved from the oath of renunciation and to be recognized, on the death of Franz Josef, as empress-queen.

(b) Hungary.

The lower chamber of the Hungarian parliament that was elected in 1896 was dissolved on September 9, 1901. The elections of 1896 sent to this body 282 members of the Liberal party, which has been the dominant party in Hungary for thirty years; 48 Kossuthists, followers of Franz Kossuth, who form the so-called party of independence; 37 Nationalists, who subsequently allied themselves with the Liberals; 20 Ultramontanes, "the people's party"; 7 Ugronists, Radical Clericals; 10 independents; and the 40 deputies from Croatia-Slavonia. The history of this parliament is divided

into two distinct periods—under the ministry of Baron Banffy and under the present ministry, that of M. Koloman de Szell. In 1898 dissensions arose among the Liberals, and obstructive tactics were employed; such measures were used, especially by one of the opposition groups led by Count Albert Apponyi and M. de Horansky, that during the last year of Banffy's régime parliamentary activity was impossible. When Szell came into power (February, 1899), this group fused with the majority and thereafter the parliament succeeded in effecting a considerable amount of legislation. Among the more important laws enacted by the legislature of 1896-1901 are the following: A law denying parliamentary jurisdiction and establishing that of the court of cassation in matters electoral; a law establishing the jury system and another concerning civil and criminal procedure; a law establishing a course of administrative instruction, and another simplifying administrative routine; a law enlarging military schools; a law concerning the regulation (at least provisional) of the relations with Austria; a law concerning the condition of farm and forest laborers; and a law looking toward the eradication of electoral corruption.

The elections to the new lower chamber in the early days of October, 1901, were particularly interesting in that they were the first held under the last-mentioned law. It appears that this law, which was a project of the Szell ministry, did not accomplish all that was expected, but it is clear that political corruption, especially in Hungary, where it has long been entrenched, cannot be quickly dislodged. For the most part, the newly elected members were unknown men. The election returns showed that the Liberal party maintains a large majority, though it lost a few seats, especially to the Kossuthists. The success of the Kossuth party seemed to indicate at least a little trouble to the ministry. It is composed of men of radical tendencies, who are striving for the economic separation of Hungary from Austria and demand that the only relations common to the two countries be in the person of the emperor-king. The Liberals, on the other hand, desire the continuation of the union on the basis of the compromise of 1867. It seems not unlikely that the Kossuthists will have considerable weight in the chamber. The election showed the beginning of a new party, which though represented by only five deputies in the chamber, may exert considerable influence. This party, which represents non-Magyar nationalities, is hostile to the hegemony exercised by the Magyars; if it should develop strength, Hungary might be forced to experience vexing racial disputes such as Austria has suffered for many years.

Some of the losses of the Liberal party are worthy of note. More than eighty members of the old majority voluntarily withdrew their candidature, many of them fearing defeat. Among this number was M. Maslenovitch, the well-known economist and advocate of free trade. M. Alexander Plosz, the minister of justice, was defeated, as was also M. Koloman Tisza, the former premier, who had represented his district for thirty years. Death removed two deputies who were well known throughout Europe, M. Desider de Szilagyi (*q.v.*) and M. Auguste de Pulszky. At the time of the politico-religious reforms in 1894 de Szilagyi, as minister of justice, first in the Szapary ministry and then in the ministry of Wekerle, carried out a successful struggle in the reform movement against clerical intrigues. He retired from public life in 1895, but soon after was recalled and became president of the lower chamber, in which position he remained until 1898, when he resigned on account of the reactionary character of the Banffy ministry. As a simple deputy he exercised a great influence in the last two years of his life. Not only the Liberal party but Hungary itself has probably suffered no loss so great as that of de Szilagyi since the death of Francis Deak in 1876. Pulszky, though a man of less importance, was one of the most learned and eminent speakers of the parliament.

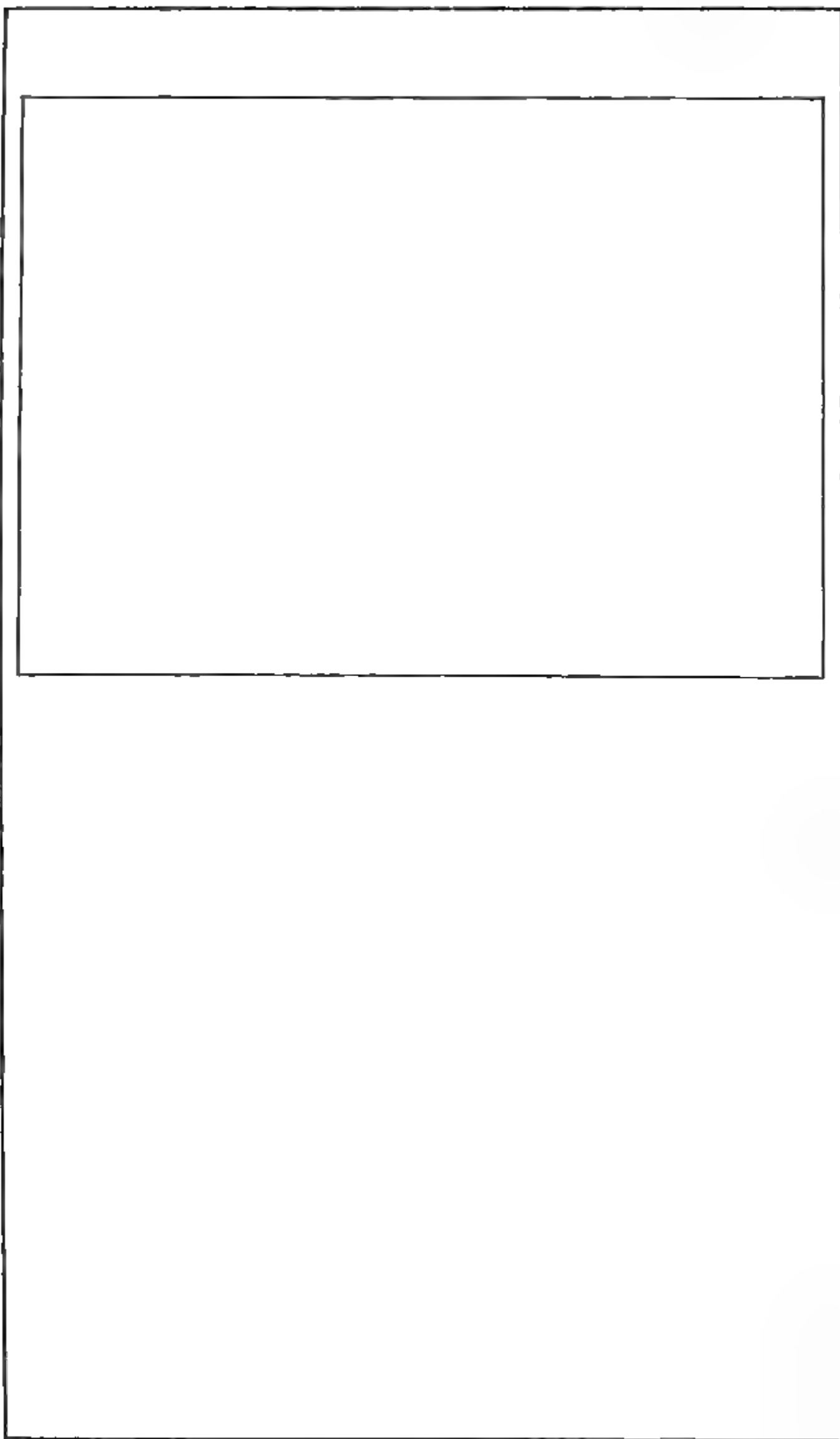
On October 28, 1901, the Hungarian *Reichstag* was opened by the king, who, in his speech from the throne, emphasized "the necessity of a permanent settlement of the commercial questions between Hungary and Austria, and announced a rearrangement of the customs tariff and various measures of administrative and economic reform." A principal feature of the new situation was the election of Count Albert Apponyi as president of the lower chamber on October 31, a "brilliant sanction" of the fusion that had existed for two years between the majority and the group of the centre Left. With regard to the problems before the new parliament and the necessity of a spirit of disinterested patriotism, M. Szell said a short time before the opening of the session that nothing must be permitted which could arrest the development of Hungary's economic forces, and that there was good reason to trust that both the agricultural and the commercial interests of the country would be safeguarded in the legislature. As to the relations of Hungary with Austria the premier considered the maintenance of the *status quo* as an absolute necessity. It was felt that both the agricultural and economic development of Hungary depended to a considerable extent upon the maintenance of existing relations. On the other hand it was stated in some quarters that should the disposition which had manifested itself in Austria to regard Hungary as an "agricultural colony" continue, Hungary

would not refrain from protecting itself by establishing a tariff system against Austria. In the fall the Hungarians were somewhat irritated by a speech of Dr. von Koerber, the Austrian premier, in the *Reichsrath*, in which he stated that the renewal of the customs union between the two countries was advisable, but that thereafter "absolute honesty" must be observed in carrying out the compact.

In the spring of 1901 the government had under consideration a plan which, if carried out, will supplement the projected canals of Austria. It was proposed to connect by canals the waters leading to the Black and Adriatic seas with those leading to the Baltic, and to construct a waterway from the Danube to the port of Fiume.

AUTOMOBILES. The year 1901 witnessed substantial progress in the improvement and use of the automobile both abroad and in the United States. Popular interest in the new vehicle was also quite as intense as in previous years, being kept up by long-distance races, speed trials, endurance trials, and exhibitions, and also by many serious accidents to careless drivers. In few cases, if any, have these accidents been the fault of the machine itself. On the whole it is safe to say that the automobile was a safer and more serviceable machine at the end of 1901 than it was twelve months previous. It is generally agreed also that, in America at least, the greatest improvement has been made in gasoline vehicles. Most of these improvements have been the adoption of European ideas and their adaptation to American practice and tastes. For example, the work of the year showed an increasing tendency to place the motor in front of the dash, to suppress the reach and stereotyped wagon running gear, to adopt forced circulation to motor cooling, and to increase the refinement of motor design and construction. For heavy vehicles side chain drive, and for light vehicles bevel-gear drive are becoming the accepted models. Wire wheels have almost entirely disappeared from heavy vehicles, and wooden wheels are taking their place; the wheel base is being made longer. In respect to steering gear it is to be noted that wheel gear has supplanted the lever and tiller on nearly all heavy vehicles. In steam automobiles, if we except heavy steam wagons and trucks, very few, if any, radical changes are recorded by the year's progress, and the advance among electric vehicles is even less marked.

In France and in Europe generally the status of the three types of automobile motor power, namely, steam, gasoline, and electricity, is about as follows: About the only form of light steam carriage in use is the Serpollet, and this is not much employed. Among the various types of electric vehicles used in France the Krieger, the Jenatzy, the Jeantaud, and the Mildè are the most notable. The Krieger has the steering and motor wheels in front; there are two motors, compound wound; the batteries are divided, part being in front and part in the rear; the controller is vertical, having seven positions, four ahead, one braking, and two backward; the tires on the front wheels are pneumatic and are solid on the rear wheels; and the motors are hung on springs. The Jenatzy is chain-driven, and, besides the usual hand control, is provided with a foot lever, which throws in more or less resistance and consequently regulates the speed. In the Jeantaud carriage the motor is hung on the frame and a chain drive to the rear axle is used. The Mildè vehicle resembles closely the Columbia electric carriage used in America. French gasoline automobiles are of two types, the heavy carriage and the so-called *voiturette*. As many recent American vehicles have been confessedly modeled on French precedents, some of the characteristic features of the latest French gasoline automobile may well be described. The motors now used in the heavier carriages are slow-running, the number of turns a minute, without acceleration, being limited to about 800; in motors where the stroke is short the number of turns can be accelerated up to 1,100 and 1,200 a minute. There has been recently a gradual cutting down of stroke, the diameter of the cylinder and the length of stroke being in many instances almost the same. Almost all the successful motors are of the vertical type and are placed in front of the dash. Two cylinder motors are used almost universally in carriages developing up to 8 horse-power, and four cylinder motors for powers above this. The inlet valves are so arranged as to be easily removed and examined; the extremest valves, made of special steel, are so arranged as to be readily taken out; the pistons are all fitted with oil grooves; the bearings of the crank-shaft and motor are made very large. With few rare exceptions two cylinder motors are governed, the grooves being usually of the ball type. The change gear most used is the sliding train. The carburettor is of the float-type. Recently tube ignition is being given up, and electric-spark ignition in one form or another adopted. These igniting devices are usually hand regulated. Pedal control is almost universally adopted, two pedals being used, one releasing the clutch and the other releasing the clutch and braking. Wheel-steering gear is used with a lever control of the change gear. The muffler is little used in France, no objection being raised to the noise of the exhaust. Automatic oiling devices are used. Flanged radiators are used and the cooling water is usually pumped by a high-speed centrifugal pump run by friction from the flywheel. The French *voiturette* distinguished from the heavier carriage by its use of a high-



AUTOMOBILES OF 1901.—Steam Carriage (Upper). Gasoline Touring Car (Lower).
Courtesy International Motor Car Co.

speed motor and bevel gear drive instead of chain drive. It has not attained so high a degree of perfection as the carriage.

The preceding statements relate almost solely to light vehicles; for heavy vehicles for freighting purposes, steam motive power is far in the lead of either gasoline or electricity. England, which has taken a position in the rear of most other countries in developing light motor vehicles, is far in advance of all other countries in the development of the heavy steam wagon and truck. As has been its practice for several seasons, the Liverpool Self-Propelled Traffic Association held, in the summer of 1901, a formal trial of motor vehicles for heavy traffic. Eleven vehicles were submitted for this trial, two of which were propelled by gasoline engines and nine of which were steam wagons. Three of the steam vehicles were for different reasons unable to complete the full trial. The results of the trials may be briefly summarized from the report of the judges, as follows: A gradual and marked improvement in the construction and behavior of heavy motor vehicles had taken place since the first trials made three years before, and reliance may now be placed upon the better makes for regular employment in general haulage operations where due care and supervision are exercised. At the end of 1901 there were in operation in England a considerable number of steam trucks of four and five tons carrying capacity. In France very few heavy motor trucks have been built. In Germany one firm has built a number of gasoline trucks which have operated with great success. The building of heavy motor wagons for freighting purposes seemed in 1900 to be destined to receive considerable attention in the United States, but the records of construction in 1901 have not fulfilled this promise. Indeed, these records have been distinctly disappointing in many respects.

Racing.—In the way of races, the long-distance Paris-Berlin race in June, won by M. Fournier, undoubtedly takes rank as the leading event, with the Paris-Bordeaux race as a close rival. The following figures give the essential details of these two races as compared with other long-distance contests. In a manner these figures tell the story of the automobile, because high speed means good construction. Such figures are, however, recorded only by racing machines; the tendency during 1901 was more pronounced than ever before to differentiate such vehicles from those used for pleasure and business.

Year.	Course.	Miles.	Time hrs. min.	Miles per hr.	H.-P.
1895.	Paris-Bordeaux—Paris	715	48—48	14.67	4
1896.	Paris-Marseilles—Paris	1,068	64—42	16.52	8
1898.	Paris-Amsterdam	933	33—04½	28.21	8
1899.	Tour of France.....	1,429	42—33	33.58	16
1900.	Paris-Toulouse—Paris	837	20—50	40.21	28
1901.	Paris-Bordeaux	346	6—07¾	56.48	60
1901.	Paris-Berlin	745	17—03¾	43.66	60

Perhaps the most notable short-distance races of 1901 were those over a straight-away mile course on the Coney Island Boulevard, New York City, on November 16. The results were tabulated by the *Automobile*, as follows:

MOTOR BICYCLES.				
Name.	Maker.	H.-P.	Time.	
Robert Atkinson.....	Waltham Mfg. Co.....	4	1.36	
GASOLINE, UNDER 1,000 POUNDS.				
Jaques Longues.....	De Dion-Bouton.....	10	{ 1.27 3-5	
			{ 1.27 4-5	
GASOLINE, 1,000 to 2,000 POUNDS.				
Percy Owen.....	Winton Motor Carriage Co.....	12	{ 1.63 3-5	
			{ 1.69 2-5	
C. F. Stralem.....	Panhard-Levassor.....	7	1.67 2-5	
GASOLINE, OVER 2,000 POUNDS.				
Foxhall P. Keene.....	Mors.....	40	{ 1.21 4-5	
			{ 0.54 2-5	
Albert C. Bostwick.....	Winton Motor Carriage Co.....	40	{ 0.56 2-5	
			{ 1.00 3-5	
Henri Fournier.....	Mors.....	40	{ 0.51 4-5	
			{ 0.52	
L. Charley.....	Daimler.....	35	1.08	
J. Wesley Blair.....	Panhard-Levassor.....	16	1.43	
STEAM.				
Thomas D. Dewitt.....	Locomobile.....	4½	1.33 1-5	
S. T. Davis, Jr.....	Locomobile.....	4½	{ 1.15	
			{ 1.16 3-5	
B. L. Wright.....	Grout Bros.....	4	1.56 4-5	
W. J. Stewart.....	Locomobile.....	3½	1.67 1-5	
ELECTRIC.				
A. L. Riker.....	Riker.....	...	1.08	

In October, 1901, on the Empire one-mile oval trotting track at Yonkers, N. Y., Mr. Bostwick drove his machine 25 miles in 32 minutes 20 4-5 seconds, and subsequently covered one mile in 1 minute 13 2-5 seconds. M. Fournier on the same track drove his machine 6 miles at the average speed of a mile in 1 minute 7 5-6 seconds. But it may be seen from the foregoing table that these figures were excelled in November. It should be pointed out that the fast time of M. Fournier, Mr. Keene, and Mr. Bostwick was made with a flying start.

AZORES, a group of islands in the north Atlantic, about 1,000 miles directly west of Portugal, of which kingdom they form administratively an integral part. Their area is 1,005 square miles, and their population, which remains practically stationary, was 255,594 in 1890. Ponta Delgada, the chief town, had a population of 16,767 in 1890, and Angra, the capital, 11,067. The imports (with Madeira) amounted in 1897 to £239,531, and the exports to £272,222. The chief product of the islands is fruit, 32,000 boxes of oranges being exported in 1898. An exhibition and fair was opened at St. Michael's on July 1, 1901, in honor of the first visit of the king and queen of Portugal to the islands. During 1901 a new cable was laid between Horta, on the island of Fayal, and Waterville, Ireland.

BABCOCK, MALTBIE DAVENPORT, American clergyman, died at Naples, Italy, May 18, 1901. He was born at Syracuse, N. Y., in 1858, graduated from Syracuse University in 1879, and from the Auburn (N. Y.) Theological Seminary in 1882. Dr. Babcock went from his first pastoral charge at Lockport, N. Y., in 1887 to the Brown Memorial Church of Baltimore, Md., remaining there until he was called to the Brick Presbyterian Church in New York City in 1900, to succeed the Rev. Dr. Henry Van Dyke. As a magnetic pulpit orator and an energetic director of his church's affairs, he became widely and favorably known. He was also the author of a number of religious poems and hymns. While on a journey to the Holy Land in company with other American clergymen he fell ill, and during the delirium of fever took his own life in a Naples hospital.

BABYLONIA. See **ARCHÆOLOGY.**

BACTERIA. See **ANTHRAX, ANTITOXIN, DYSENTERY, VITAL STATISTICS.**

BAGDAD RAILWAY. See **TURKEY** (paragraphs on History).

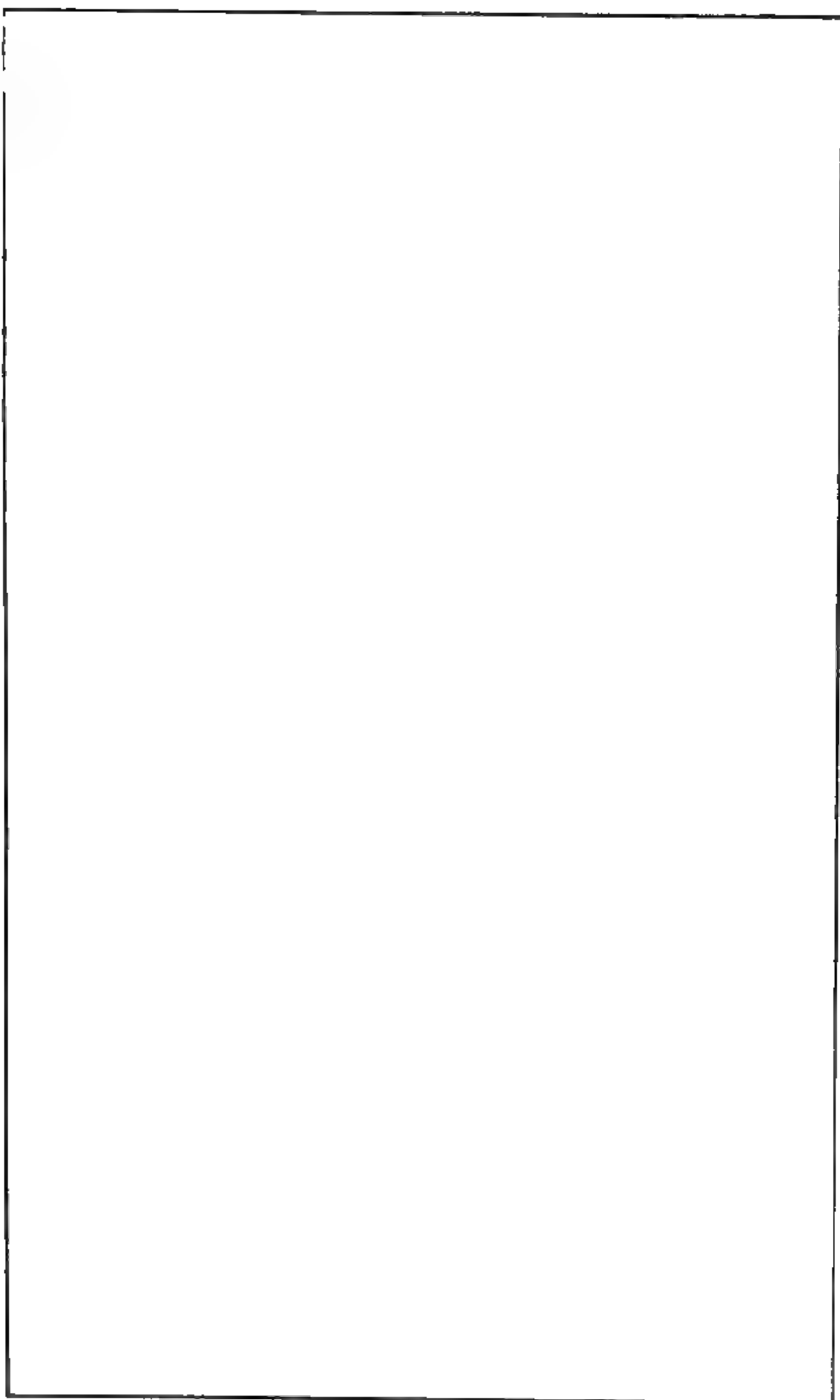
BAHAMAS, a British colony comprising 20 inhabited and many uninhabited islands off the southeastern coast of Florida. The area is about 5,450 square miles and the estimated population in 1901 about 55,500, of whom four-fifths are negroes. The seat of government is Nassau, on New Providence, the most important island. The colony is administered by a governor, Sir Gilbert Thomas Carter since 1897, who is assisted by an executive council, a legislative council, and a representative assembly.

In 1900 the revenue, which is derived mainly from the customs, amounted to £78,661, against £76,697 in 1899; and the expenditure was £82,837, against £68,749 in the preceding year. The increased expenditure was due to the establishment of a sinking fund for reducing the public debt; this debt at the end of 1900 amounted to £112,226.

Imports and exports in 1899 amounted to £329,196 and £169,148, respectively; in 1900, imports, £325,269, and exports, £172,317. The imports consist largely of British cotton goods and American food stuffs; and the leading exports are sponges, fruit, and sisal fibre. Practically all of the fruit is shipped to Baltimore, and the sponge and fibre to Great Britain. During the last five years trade has greatly increased, the imports in 1896 having amounted to only £194,474, and the exports to £138,972. In his annual report the colonial secretary said that the social condition of the people was improving, and that although they had little accumulated savings and no capital for investment but their labor, they were far removed from the desperate poverty of many of the Caribbee Islands.

BALDWIN, EVELYN BRIGGS, American Arctic explorer, member of the Peary North Greenland expedition of 1893-94 and of the Wellman expedition to Franz Josef Land of 1898-99, headed a separate expedition to the North Pole, leaving New York City early in 1901. Upon the return of the *Frithjof*, one of his ships, to Hammerfest, Norway, in August, Mr. Baldwin was reported to have been left at Cape Ziegler (80° 24' N.), preparing to advance immediately. He was born at Springfield, Mo., July 22, 1862, and was educated in Illinois. After several years of experience as a farmer, teacher, and school superintendent, he became an observer in the United States Weather Bureau in 1892. As inspector-at-large in the United States Signal Service, he secured the cooperation of Mr. William Ziegler, of New York City, who fitted out the present expedition.

BALDWIN, JAMES MARK, the American psychologist, whose *Dictionary of Philosophy and Psychology* was issued in 1901, was born at Columbia, S. C., January 12, 1861, and graduated at Princeton University in 1884. Oxford University con-



RACING AUTOMOBILES.—Fournier, who holds the World's Record for Speed (Upper).
Bostwick, who holds American Speed Record (Lower).

ferred the degree of Sc.D. upon him in 1900, the first honorary degree in science ever given by that university. After teaching at Princeton (1886), at Lake Forest University (1887-89), at Toronto University (1889-93), he returned to Princeton in 1893 as professor of psychology. At Geneva, in 1896, he was president of the International Congress of Criminal Anthropology, and in 1897-98 he was president of the American Psychological Association. He is a member of many societies, and is the author of a *Handbook of Psychology* (1890), *Elements of Psychology* (1893), *Mental Development in the Child and the Race* (1896), and the *Story of the Mind* (1898).

BALIZE. See BRITISH HONDURAS.

BALKAN PENINSULA is that part of southeastern Europe lying between the Black and ~~Ægean~~ ^{Ægean} seas on the east and the Adriatic and Ionian on the west. The Danube River and its tributaries, the Save and Una, may be regarded as its northern boundary. What are usually termed the "Balkan States" are Servia, Bosnia and Herzegovina, Montenegro, Bulgaria, and Roumania (*q. v.*), while Turkey and Greece (*q. v.*) also lie within the peninsula.

The chronic condition of trouble and rumors of trouble in the Balkans continued in 1901. One of the important developments of the year, outside Turkey proper, was the apparent growth of Russian influence at the expense of Austrian. In Roumania, which is probably the strongest of the former Ottoman states to the north of Turkey proper, and which politically, though not geographically, is a constituent part of the Balkan peninsula, Austrian influence remained paramount. In Servia, however, among other things, should be noted the alleged military *rapprochement* with Russia; in Bulgaria, a Russian loan and the official visit of the Grand Duke Alexander Mikhailovitch; while Montenegro is steadfastly pro-Russian. Moreover certain Austrian journals published exposures of alleged Russian intrigues in Servia, Bulgaria, Roumania, and Macedonia, and the *Pester Lloyd*, a semi-official Hungarian organ, accused the Bulgarian government of permitting Russian war vessels to navigate the lower Danube outside of Russian territory, thus violating the treaty of Paris. In a report on foreign affairs, May 22, 1901, Count Goluchowski, the Austro-Hungarian foreign minister, referred to the Balkan situation as critical, and intimated that Austria-Hungary could not permit any attempt at changing the *status quo* in the peninsula.

BALLOONS. See AERIAL NAVIGATION.

BALUCHISTAN, a country of southern central Asia, bounded by Afghanistan, India, the Arabian Sea and Persia. It has an area estimated at 130,000 square miles and a tribal population estimated at 500,000. The Baluchis, a nomad race, are most widely spread; the dominant race are the Brahurs of the eastern plateau. The territory comprises four administrative parts, viz.: (1) independent Baluchistan, (2) Quetta and the Bolan, administered by the British government under a permanent lease from the Khan of Khelat, (3) British Baluchistan, and (4) the tribal territories of Pathan and Baluch. Quetta is the largest town; Khelat the capital. Independent Baluchistan is governed by Mir Mahmud, Khan of Khelat, who is the head of a confederacy of tribal chiefs, and whose powers are loosely defined. In important matters he is amenable to the British agent of the governor-general, who decides tribal disputes, and holds the balance of power. The Khan receives from the Indian government an annual subsidy of 100,000 rupees (rupee equals 30.4 cents), besides 30,000 rupees in lieu of the transit tolls on merchandise in the Bolan pass, and a quit rent of 25,000 rupees (recently increased), in lieu of the revenues of Quetta and Nushki. There is no regular standing army, except a force of about 1,200 men maintained by the Khan, who would be able to muster for war a force of about 10,000, but with only uncertain armament. Much of the country is mountainous and adapted to grazing, supporting great herds of sheep and some camels. The rainfall is uncertain. Most of the products found in India may be raised. Coal has been mined successfully along the line of railway from Sind to Pishin; lead, copper, and petroleum have been found. The exports include wool, hides, modder, dried fruits, bdellium, tobacco, and dates. The principal travel of the country is still accomplished by the use of camels over the caravan routes. Quetta is connected by rail with the Indian railway system, enabling the government to control this strategic centre. A commercial route across the country to Persia, beginning at Quetta, was established some years ago, over which a great part of the trade of India with Persia and Russian central Asia is carried on. A British consulate has been opened at Seistan, in Persia, where Russia seems also intending to establish a consulate, in competition for the commercial supremacy of southern Persia. In furthering British-Indian trade with this region, an agreement has been made with the Shah for a land telegraph line to connect Jask, on the Persian coast, with Kershan, Persia; and by a line linking Nushki with this new line at Ferman, the trade of the Quetta and Nushki commercial route to Berfond and Meshed, Persia, will be greatly facilitated. The trade with British India in 1898 (estimated) was: ex-

ports, 1,737,890 rupees; imports, 826,650 rupees; 1900, exports, 1,455,310 rupees; imports, 787,350 rupees. The present British agent at Quetta is Mr. H. S. Barnes. There are no international relations except with the Indian government.

BANCROFT, CECIL FRANKLIN PATCH, American educator, died at Andover, Mass., October 4, 1901. He was born at New Ipswich, N. H., November 25, 1839, graduated at Dartmouth College in 1860, and from Andover Theological Seminary in 1867. For a time he was a student at the University of Halle, Germany, and at various times received the degrees of Ph.D. (from New York University), LL.D. (from Yale), and L.H.D. (from Williams College). From 1860 to 1873 he filled various headmasterships, and in the latter year was called to take charge of Phillips Academy at Andover, Mass., where he remained for twenty-eight years. During this long service, Mr. Bancroft had under his care more than 6,000 students, and he had the distinction of having sent more boys to college and scientific schools than any other American educator. He held a high place in the esteem of educators all over the country.

BANKRUPTCY. The classification of business failures for 1900 and 1901 according to Dun's *Review* is given on the two pages following.

The increase in the number of insolvencies is due to the fact that the higher earnings of salaried employees and the larger returns from small investments, many of which, owing to insufficient capital or experience, went to the wall. The high solvency of 1901 is shown by the decrease of \$42,000,000 in the liabilities of failed concerns. This is the more remarkable in view of the heavy losses caused by the panic of May 9 and by the drought throughout the corn belt. The greatest increase in the number of insolvencies was in the South, a circumstance due to the failure of the cotton crop in many places and the lower price of that staple.

BANKS—BANKING. *Banking Reserves and Expansion.*—During the past two years the increasing demand for money in all parts of the country has aroused new interest in propositions looking to a safe and adequate expansion of the money supply. The conviction has also grown that this currency can be safely furnished only by the banks. At the same time, bankers have been generally ready to admit that the present banking system of the United States is faulty in the extreme, in that it is composed of a vast number of independent banks without central control, and that this situation not only involves a waste of energy in maintaining a large number of idle cash reserves, but is a source of danger in time of panic. The last report of Secretary of the Treasury Gage discussed this situation at length and presents some recommendations for change. The secretary criticised our present banking system as follows: "Admirable in many respects, experience shows that our banking system is devised for fair weather, not for storms. The individual banks stand isolated and apart, separated units, with no tie of mutuality between them. There is no obligation of duty from the strong to the weak or exposed, nor any method of legal association for common protection and defense in periods of adversity or depression." The consequence of this condition of isolation was shown to be a wholesale calling of loans at every period of stringency. The daily creations of the necessary medium of exchange, bank credits, cease or become entirely inadequate to commercial requirements. "The daily natural liquidation of credits continues, resulting in contraction. Business men carrying goods and securities by the aid of bank credit are obliged to sell with little regard to cost. Contemplated enterprises are abandoned, orders for future delivery of goods are rescinded, and as these successive steps mark the downward movement, the banker becomes the more reluctant to perform his important function of loaning his credit for commercial and industrial uses. What should be, under these circumstances, an orderly, conservative movement to more secure conditions becomes an unreasonable, panic, in which at last the entire business public is hopelessly involved. The so-called panic of 1893 is a marked example. Within a period of less than twelve months, bank credits, deposits, were contracted to a total of more than 400 millions, while the actual cash holdings by the banks were increased by nearly 50 millions." The remedy for this condition was shown to be a reorganization of the banking system in such a way as to centralize and unite the reserves of all the banks, thus bringing the aid of the stronger institutions to the support of the weak, and rendering unnecessary the heavy calling of loans, which, under present arrangements, so greatly aggravates the severity of every financial crisis. Mr. Gage also suggested a plan by which a federation might be effected. His method is the application of the principle of federation "under which the banks, as individual units, preserving their independence of action in local relationship, may yet be united in a great central institution. Formed by some certain percentage of capital contributed by the banks themselves, and its management created by the suffrage of all, it would represent the interests of the whole country. With limited powers of control over its membership in the interest of common safety, confined in its dealings to the banks and the government, it could

STATES.	TOTAL, 1901.			TOTAL, 1900.	
	No.	Assets.	Liabilities.	No.	Liabilities.
Maine.....	192	\$ 452,301	\$ 1,250,715	212	\$ 913,163
New Hampshire.....	67	397,456	771,298	66	579,200
Vermont.....	43	192,596	308,758	58	799,935
Massachusetts.....	1,125	5,779,068	17,021,717	1,123	15,300,635
Connecticut.....	834	1,203,579	2,606,302	830	4,410,797
Rhode Island.....	105	505,018	831,361	83	722,168
New England.....	1,866	\$ 8,530,006	\$ 22,790,151	1,872	\$ 22,726,796
New England, 1900.....	1,872	12,063,714	22,726,796		
New York.....	1,400	\$ 9,545,568	\$ 26,500,137	1,321	\$ 42,352,298
New Jersey.....	183	1,998,561	3,016,318	231	6,418,236
Pennsylvania.....	664	4,559,800	7,359,145	812	11,446,620
Middle.....	2,247	\$16,093,929	\$ 36,935,590	2,364	\$ 60,217,154
Middle, 1900.....	2,364	34,349,611	60,217,154		
Maryland.....	205	\$ 1,540,601	\$ 3,794,285	215	\$ 5,009,226
Delaware.....	19	55,747	134,208	22	107,640
District Columbia.....	39	283,682	503,549	51	732,642
Virginia.....	174	596,063	1,262,477	208	1,175,592
West Virginia.....	67	325,086	308,485	55	312,053
North Carolina.....	146	522,808	1,117,162	91	472,248
South Carolina.....	116	833,892	912,213	37	301,778
Florida.....	103	450,676	548,872	78	739,033
Georgia.....	268	2,214,079	2,643,330	178	2,044,037
Alabama.....	173	459,413	784,746	114	540,747
Mississippi.....	182	480,574	760,710	102	485,907
Louisiana.....	145	732,636	987,133	174	1,258,847
Tennessee.....	219	840,356	1,152,143	222	1,187,598
Kentucky.....	202	1,084,176	1,222,312	174	1,408,240
South.....	2,018	\$10,413,784	\$ 16,131,615	1,721	\$ 15,775,588
South, 1900.....	1,721	9,962,889	15,775,588		
Arkansas.....	222	\$ 651,421	\$ 1,044,896	201	\$ 758,641
Texas.....	238	1,063,873	1,870,671	332	2,271,903
Missouri.....	274	1,420,939	1,920,627	329	2,603,265
South West.....	734	\$ 3,136,283	\$ 4,836,196	862	\$ 5,633,809
South West, 1900.....	862	3,305,301	5,633,809		
Ohio.....	473	\$ 2,800,333	\$ 3,811,459	406	\$ 3,624,090
Indiana.....	279	1,143,004	1,834,307	250	1,564,842
Michigan.....	196	1,184,340	1,506,933	176	1,580,993
Illinois.....	1,201	4,200,589	11,083,922	1,063	14,021,808
Wisconsin.....	170	781,899	1,188,850	147	1,540,801
Central.....	2,319	\$10,109,665	\$ 19,425,471	2,041	\$ 22,332,536
Central, 1900.....	2,041	11,756,443	22,332,536		
Minnesota.....	204	\$ 2,457,419	\$ 3,432,561	193	\$ 1,699,828
Iowa.....	314	897,559	1,509,648	348	1,845,973
Nebraska.....	48	60,421	139,866	70	462,059
Kansas.....	149	339,319	552,965	82	290,481
Indian Territory.....	47	200,044	304,469	40	263,717
Oklahoma.....	44	183,050	283,110	38	173,000
Montana.....	52	656,101	1,079,709	57	491,178
North Dakota.....	22	98,668	141,469	22	208,763
South Dakota.....	13	40,326	58,332	32	317,627
Colorado.....	81	356,796	674,453	81	801,367
Wyoming.....	4	6,400	14,000	8	14,300
New Mexico.....	3	4,700	7,300	12	37,710
West.....	981	\$ 5,300,803	\$ 8,197,792	983	\$ 6,605,903
West, 1900.....	983	3,943,065	6,605,903		
Utah.....	50	\$ 106,886	\$ 177,054	153	\$ 978,462
Idaho.....	40	50,300	111,050	72	185,562
Arizona.....	2	11,000	23,376	14	101,457
Nevada.....				3	5,502
Washington.....	144	355,491	1,208,888	142	782,623
Oregon.....	175	408,837	1,096,905	138	866,468
California.....	422	929,904	2,146,688	405	2,266,791
Alaska.....	4	7,200	11,600	4	17,000
Pacific.....	837	\$ 1,871,518	\$ 4,775,561	931	\$ 5,203,865
Pacific, 1900.....	931	2,678,632	5,203,865		
Aggregate.....	11,002	\$55,455,940	\$113,092,376	10,774	\$138,495,673
Aggregate, 1900.....	10,774	78,079,555	138,495,673		

STATES.	CLASSIFIED FAILURES.							
	MANUFACTURING.		TRADING.		OTHER COM'L.		BANKING.	
	No.	Liabilities.	No.	Liabilities.	No.	Liabilities.	No.	Liabilities.
Maine.....	26	\$ 296,991	155	\$ 920,135	11	\$ 34,299	.....	.....
New Hampshire.....	12	252,426	52	498,303	2	20,567	.....	.....
Vermont.....	8	29,392	33	236,415	2	32,961	.....	.....
Massachusetts.....	401	7,654,069	624	6,082,708	100	3,434,940	1	\$ 1,842,986
Connecticut.....	74	1,249,764	252	1,253,050	8	103,488	4	13,922
Rhode Island.....	41	446,022	60	341,414	4	43,925	.....	.....
New England.....	562	\$ 9,887,966	1,176	\$ 9,282,025	128	\$ 3,670,160	5	\$ 1,856,910
New England, 1900.....	574	10,421,351	1,173	10,562,871	125	1,752,576	2	105,221
New York.....	460	\$12,583,290	856	\$ 9,516,066	84	\$ 4,460,771	8	\$11,202,376
New Jersey.....	58	1,334,177	114	1,269,818	11	392,323	1	58,573
Pennsylvania.....	215	5,172,299	422	1,998,845	27	193,001	2	400,000
Middle.....	738	\$19,089,766	1,392	\$12,799,729	122	\$ 5,046,095	11	\$11,690,949
Middle, 1900.....	757	25,212,921	1,492	19,578,761	115	17,426,452	6	23,575,126
Maryland.....	52	\$ 2,032,474	121	\$ 1,320,890	32	\$ 440,921	3	\$ 662,320
Delaware.....	6	78,500	12	54,708	1	1,000	.....	.....
District Columbia.....	5	49,507	21	222,123	3	231,919	1	269,000
Virginia.....	18	543,529	155	618,648	1	100,000	.....	.....
West Virginia.....	20	91,246	47	217,299	.....	.....	.....	.....
North Carolina.....	11	142,369	131	954,145	4	20,647	2	116,000
South Carolina.....	3	220,000	113	682,213	.....	.....	1	15,000
Florida.....	11	176,715	91	366,187	1	7,000	.....	.....
Georgia.....	23	671,175	239	1,595,194	6	176,951	8	627,362
Alabama.....	12	85,320	159	658,177	2	41,249	1	200,000
Mississippi.....	8	82,848	144	677,862	.....	.....	.....	.....
Louisiana.....	16	186,756	127	684,653	2	116,724	.....	.....
Tennessee.....	15	74,674	200	947,669	4	129,800	5	150,162
Kentucky.....	25	415,069	169	798,243	8	14,000	.....	.....
South.....	225	\$ 5,059,482	1,729	\$ 9,791,922	64	\$ 1,280,211	21	\$ 2,039,844
South, 1900.....	211	5,240,940	1,431	8,996,006	79	1,556,642	19	6,097,700
Arkansas.....	18	\$ 128,352	197	\$ 898,626	7	\$ 17,920	.....	.....
Texas.....	10	107,074	226	1,609,104	2	94,493	1	\$ 143,000
Missouri.....	52	599,786	237	1,346,628	5	174,214	.....	.....
South West.....	60	\$ 635,211	660	\$ 3,914,358	14	\$ 286,627	1	\$ 143,000
South West, 1900.....	103	1,189,013	745	3,921,455	14	523,361	5	323,000
Ohio.....	124	\$ 1,858,515	315	\$ 1,820,599	34	\$ 132,345	6	\$ 476,000
Indiana.....	48	504,901	223	1,267,795	8	71,611	7	53,600
Michigan.....	35	489,512	159	990,942	2	26,479	2	115,000
Illinois.....	313	4,186,733	724	3,622,619	164	3,275,570	6	362,270
Wisconsin.....	47	591,848	118	587,266	5	9,716	3	639,437
Central.....	567	\$ 7,630,509	1,539	\$ 8,279,241	213	\$ 3,515,721	24	\$ 1,646,207
Central, 1900.....	465	7,978,821	1,448	8,756,069	128	5,597,666	17	4,908,755
Minnesota.....	29	\$ 170,276	170	\$ 1,758,285	5	\$ 1,504,000	1	\$ 94,551
Iowa.....	48	262,300	251	1,145,758	15	100,990	2	50,000
Nebraska.....	2	8,826	46	131,031	.....	.....	.....	.....
Kansas.....	16	11,015	130	537,634	3	4,216	3	25,000
Indian Territory.....	.....	.....	46	269,469	1	15,000	.....	.....
Oklahoma.....	.....	.....	44	283,110	.....	.....	1	5,000
Montana.....	5	663,189	47	396,520	.....	.....	.....	.....
North Dakota.....	1	811	21	140,658	.....	.....	.....	.....
South Dakota.....	2	13,850	11	44,482	.....	.....	.....	.....
Colorado.....	5	49,545	75	612,908	1	12,000	1	8,000
Wyoming.....	.....	.....	4	14,000	.....	.....	.....	.....
New Mexico.....	.....	.....	3	7,900	.....	.....	.....	.....
West.....	108	\$ 1,200,411	848	\$ 5,361,175	25	\$ 1,636,206	8	\$ 182,551
West, 1900.....	130	1,754,969	828	4,681,968	25	168,948	8	265,400
Utah.....	2	\$ 1,502	47	\$164,552	1	\$ 11,000	.....	.....
Idaho.....	7	17,300	32	92,250	1	1,500	.....	.....
Arizona.....	.....	.....	2	28,376	.....	.....	.....	.....
Nevada.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington.....	38	427,269	101	307,609	5	474,010	3	\$ 267,481
Oregon.....	52	520,237	112	469,139	11	107,529	1	191,852
California.....	87	541,330	323	1,563,664	12	41,694	.....	.....
Alaska.....	.....	.....	4	11,600	.....	.....	.....	.....
Pacific.....	186	\$ 1,507,638	621	\$ 2,632,190	30	\$ 635,733	4	\$ 459,313
Pacific, 1900.....	169	1,904,127	727	2,926,454	35	873,304	2	47,361
Aggregate.....	2,441	\$44,960,963	7,965	\$52,060,640	596	\$16,070,753	74	\$18,018,774
Aggregate, 1900.....	2,409	51,702,143	7,844	59,418,592	621	27,377,939	59	35,617,663

become the worthy object of a perfect public confidence. By the concentration of unemployed reserves from sections where such reserves are not needed, it could redistribute them in part as loans where most needed, and thus bind together for a common strength and protection the loose, unrelated units, in whose separation and isolation the greatest weakness of our banking system is now to be found." These suggestions for banking reform concern also the disposition of the treasury surplus, a matter which is arousing the deepest concern among business men at the present time. The present estimate of receipts and disbursements indicate a total surplus of \$100,000,000 for the fiscal year ending June 30, 1902. (See UNITED STATES, paragraph Revenue and Expenditure.) This is a larger working balance than is carried by any treasury or financial institution in the world; it is not demanded by the requirements of fiscal security, and in times of active business locks up in the treasury a supply of currency which is badly needed in the money market. The *Commercial and Financial Chronicle* recently remarked of this condition: "Such a surplus forebodes an active contest between the money market and the sub-treasury." The remedy offered by Mr. Gage for the imperfections of the banking system applies also to the difficulty presented by the surplus. He proposes, in effect, that the treasury should deposit its surplus cash in a central institution, and that the reserves of the banks should be deposited in the same place. This central reserve bank would thus bear the same relation to the American money market that the Bank of England sustains to the banks of the United Kingdom; it would be the depository of all the unused cash of the country and would be able, because of its immense reserve, to loan freely in every time of monetary strain. Secretary Gage further elaborated his ideas on this subject at a dinner of New York bankers, and they have met with much favorable comment in many quarters. The same idea of a central reserve bank was put forward by Mr. H. B. Stickney, president of the Chicago Great Western Railway, in speeches delivered before the Bankers' Convention on October 5, 1901, at Milwaukee, and before the Chicago Bankers' Association on December 13. These addresses were widely quoted and discussed. Mr. Stickney's proposition was as follows: Let the government get out of the banking business and thus throw the burden of maintaining the gold reserve upon the banks. "The impossibility of more than 9,000 banks protecting the gold reserve against exportation would of itself necessitate a central reserve bank, to which would be delegated the sole responsibility of protecting the reserve." Mr. Stickney also answered the objection that such a bank would become a dangerous monopoly. "The necessity of keeping 45 per cent. of reserve would render it incapable of competing, except in large transactions, with banks which carry no more than 5 to 8 per cent. of reserve. It is my conviction that if the restrictions of the American banking laws were repealed and banking made free, there would be developed in the United States a banking system substantially on the lines of the Scotch-English system. In process of time, one of the systems of branch banks would demonstrate its fitness, and solely by reason of its superior fitness, not by force of legislation, it would be selected by the other banks as the central reserve bank."

Currency Questions.—Secretary Gage, in his annual report, also dealt with the subject of the currency. He pointed out that the paper currency of the United States consisted of \$346,000,000 of government notes and a little more than \$360,000,000 of national-bank notes. The amount of this paper currency is strictly limited. The government notes cannot be increased in amount, and, while in theory the only limit to the expansion of the national-bank currency is the amount of government bonds in the market, as a matter of fact, the price of government bonds is now so high as to present to a bank buying bonds and issuing notes in a locality where the rate of interest is 6 per cent., a profit of one-half of one per cent. At its present rate of growth, our population in 1950 will probably amount to 190,000,000, and to meet the needs of this rapidly growing population a steady expansion of the paper money supply is necessary. Our present system of currency is also defective, on account of its inflexibility and consequent lack of adaptation to the changing requirements of trade. It is impossible that the government should further increase its demand obligations which have always been a menace to its financial stability. Indeed, in the opinion of the secretary, prudence demands that the amount of these demand obligations should be reduced. The proper agencies for the expansion of the circulating medium are the banks, by means of a credit currency. Already 90 per cent. of the business of the United States is transacted by the use of bank credits. "It is no strain on language, nor does it do violence to truth, to say that through the loaning operation of the banks, the medium of exchange is expanded and contracted by millions every day. Now there is no difference whatever in principle between the bank's obligation to pay, expressed by a credit on their books, and an obligation to pay expressed in the form of a note payable to bearer, which may be transferred from hand to hand. If it be of public advantage that bank credit be made available through the machinery of checks or transfer orders to those who can make the

more convenient use of the credit in that form, there can be no primary reason why to those who find their requirements better served by the bank's credit in the form of bank notes, they should not be issued. It would appear right and reasonable, then, that the governing power should surround the bank credit utilized in the form of bank notes, with such necessary guards and guarantees as may be required to make them safe, free from risk of loss, in the hands of those who have little choice as to whether or not they will receive them in exchange for their wares or the payment of wages. Having done this, the government's responsibility may rightfully be said to terminate." In order safely to attain the desired end of an adequate and elastic currency, and at the same time relieve the government from a portion of its demand obligations, the secretary suggested the following amendments to the existing law: (1) Any national banking association which shall deposit with the United States treasurer 30 per cent. of its capital in United States bonds and 20 per cent. in United States notes as security, and which shall pay annually one-fourth of one per cent. of its capital stock into a 'guaranty fund' for the redemption of the notes of failed banks, shall be entitled to issue its circulating notes to an amount equal in value to its paid-in and unimpaired capital. When such a bank becomes insolvent, the treasurer shall sell the bonds on deposit, and transfer the proceeds, together with an amount of United States notes equal to the amount deposited as security, to a special fund for the redemption of the notes of the failed banks, and he shall make up the cash equivalent of its outstanding notes by adding to these funds, from the 'guaranty fund.' The amount taken from the 'guaranty fund' shall be assessed against the receiver of the bank in question and when recovered shall be restored to that fund. It was estimated that under these amendments to the existing laws, the total circulating medium would be increased in three years by more than 300 millions, and also that by impounding the greenbacks, the burden of redeeming them would be taken from the government. At the end of three years, the demand obligations would be reduced to 146 millions, as compared with 150 millions of gold reserve. The estimated profit on the issue of notes under these circumstances in a locality where the rate of interest is 6 per cent., and where the whole amount of notes authorized is issued would be 2.35 per cent. as compared with one-half of one per cent. under the present system. In answer to the objection that the guaranty fund proposed would be too small for safety, the secretary shows that had this system been in operation for the past thirty-six years, among the national banks, the note holders of all insolvent banks would have been fully protected, and there would have remained to the credit of the guaranty fund \$27,421,959.

Resources of Banks in the United States.—The statistics for all banks of the United States, from reports made to the comptroller of the currency on or about June 30, 1901, show aggregate resources of \$12,329,560,255, a gain over the preceding year of \$2,460,000,000. The population of the United States on June 1, 1901, as estimated by the government actuary, was 77,647,000, making the average per capita resources of all banks, \$158.79; this average per capita being made up by the several classes of banks as follows: national, \$73.10; State, \$27.47; savings, \$35.50; private, \$1.92; trust and loan, \$20.80. The largest per capita resources of all banks was in the New England States, the per capita there being \$351.68. The Eastern States followed with a per capita of \$338.32; and then came in order, the Pacific States, per capita, \$179.74; the Middle States, per capita, \$113.13; the Western States, per capita, \$82.01; and the Southern States, per capita, \$34.30. The Southern States, possess, according to the number of inhabitants, less than half the banking resources of any other section of the country, and between one-fourth and one-fifth of the average banking resources of the country. At the same time it is significant, as indicating the relative strength and stability, or the lack of these qualities in Southern banks, that while the New England States have no private banks, and State banks with per capita resources of only \$2.58 out of total per capita resources of \$351.68, the Southern States out of total per capita resources of \$34.30, have private and State banks with per capita resources of \$21.14.

Acting with the Internal Revenue Bureau, the comptroller of the currency in 1899 made a special investigation relative to the number of depositors and borrowers and the amount of deposits and loans of all banks in the United States. The estimated capital of the 12,804 banks, of which information was obtained, was shown to be approximately \$1,150,000,000, deposits \$7,513,954,361, and loans and discounts \$5,751,467,610. For the fiscal year ending June 30, 1901 (including returns from national banks of date July 15, 1901), there are shown statistics relating to the principal items of resources and liabilities of 12,972 banks and bankers, with capital of \$1,138,042,134; surplus and undivided profits of \$693,465,095 and \$270,855,253, respectively; deposits, \$8,619,285,110, and loans and discounts, \$6,491,630,743. In the New England States there are shown to be in operation, by these returns, 1,103 banks, with deposits aggregating \$1,511,209,112, and loans of \$1,112,156,141. In the Eastern States the returns from 1,976 banks show deposits aggregating \$4,156,162,050

STATES, ETC.	1901.							1900.
	AVERAGE PER CAPITA IN—					ALL BANKS.		Total resources of all banks, in millions.
	National banks.	State banks.	Loan and trust companies.	Savings banks.	Private banks.	Resources.	Average per capita.	
Maine.....	\$ 66.37		\$ 20.99	\$106.19		\$ 134,397,234	\$192.55	126.1
New Hampshire.....	68.37	\$ 5.01		161.21		97,354,459	234.59	89.9
Vermont.....	74.34			125.75		69,031,039	200.09	65.6
Massachusetts.....	169.28		50.13	200.36		1,203,065,991	419.77	1,154.1
Rhode Island.....	106.17	3.18	132.24	174.29		182,157,339	415.88	172.0
Connecticut.....	102.08	12.06	15.60	209.63		314,876,045	339.46	295.4
Total New England States.....	\$127.72	\$ 2.58	\$ 40.57	\$180.81		\$ 2,000,872,007	\$351.68	1,903.1
New York.....	\$205.59	\$ 63.25	\$132.52	\$149.21	\$ 0.31	\$ 4,065,005,851	\$548.88	3,507.4
New Jersey.....	64.53	6.53	33.99	36.00		272,500,724	141.05	242.0
Pennsylvania.....	118.02	17.29	44.93	19.29	1.46	1,289,185,995	200.99	1,127.7
Delaware.....	64.06	13.45	29.09	33.73		26,244,161	140.33	24.0
Maryland.....	84.32	7.92	16.82	53.26	1.45	197,345,676	163.77	182.3
District of Columbia.....	96.68		64.45	4.71		47,435,859	165.84	43.3
Total Eastern States.....	\$146.06	\$ 34.67	\$ 78.27	\$ 78.54	\$.78	\$ 5,897,718,266	\$338.32	5,126.7
Virginia.....	\$ 23.32	\$ 19.87				\$ 81,030,106	\$ 43.19	72.2
West Virginia.....	30.42	34.56		\$.59		64,388,420	65.57	51.8
North Carolina.....	8.73	6.50		1.26	\$.80	33,272,402	17.29	29.1
South Carolina.....	9.77	3.81		5.29		25,877,220	18.87	23.8
Georgia.....	11.76	19.53			.31	71,374,089	31.60	61.0
Florida.....	23.34	8.44				18,214,023	31.78	14.5
Alabama.....	11.99	2.35			.62	26,709,453	14.86	26.2
Mississippi.....	4.57	15.19				31,204,590	19.76	25.9
Louisiana.....	29.19	18.97				67,962,865	48.16	56.4
Texas.....	42.38				2.02	139,506,806	44.40	98.5
Arkansas.....	4.75	6.16			.27	14,891,718	11.18	12.1
Kentucky.....	31.83	23.90	\$ 1.43			124,566,381	57.16	119.9
Tennessee.....	21.11	11.71		2.72		72,798,068	35.54	57.3
Total Southern States.....	\$ 20.70	\$ 12.31	\$.14	\$.71	\$.44	\$ 771,595,141	\$ 34.30	648.7
Ohio.....	\$ 78.01	\$ 34.82		\$ 11.04	\$ 6.13	\$ 547,544,791	\$130.00	460.6
Indiana.....	43.23	10.05	\$ 4.83	2.84	3.92	165,547,649	64.87	144.5
Illinois.....	90.63	52.11			4.08	723,823,647	145.82	614.5
Michigan.....	37.87	59.03			2.14	243,343,547	99.04	211.9
Wisconsin.....	46.92	28.80		.32	6.43	173,590,749	82.27	151.9
Minnesota.....	49.21	25.04	2.44	8.13	2.54	157,161,271	87.36	141.6
Iowa.....	49.35	23.77		37.79	8.73	271,215,591	119.64	216.3
Missouri.....	74.08	41.19			3.38	374,092,210	118.65	294.0
Total Middle States.....	\$ 64.38	\$ 36.77	\$.71	\$ 6.59	\$ 4.68	\$ 2,656,319,455	\$113.13	2,235.3
North Dakota.....	\$ 27.63	\$ 23.21				\$ 16,931,279	\$ 50.84	16.0
South Dakota.....	26.77	36.70				25,832,269	63.47	21.0
Nebraska.....	69.12	37.55				113,816,526	106.67	100.3
Kansas.....	39.51	32.29				106,041,062	71.80	84.2
Montana.....	75.26	52.50				32,449,729	127.76	30.6
Wyoming.....	65.39	9.84			\$ 14.94	8,656,331	90.17	7.5
Colorado.....	135.71	20.09			7.06	90,225,391	162.86	80.3
New Mexico.....	31.38	8.77				7,990,238	40.15	7.7
Oklahoma.....	25.45	17.21				18,431,571	42.66	8.3
Indian Territory.....	20.39				.67	8,697,479	21.06	4.3
Total Pacific States.....	\$ 53.22	\$ 27.72			\$ 1.07	\$ 429,071,875	\$ 82.01	360.2
Washington.....	\$ 58.47	\$ 22.04			\$ 8.97	\$ 47,869,226	\$ 89.48	41.5
Oregon.....	48.78	9.16			.65	24,841,792	58.59	23.4
California.....	48.06	108.32		\$123.65	1.96	426,934,556	281.99	384.8
Idaho.....	33.38	6.88			1.13	6,996,435	41.39	6.0
Utah.....	40.65	137.55				50,431,711	178.20	42.3
Nevada.....	15.02	53.71			1.77	2,961,090	70.50	27.5
Arizona.....	29.60	30.86				7,677,813	60.46	5.9
Alaska.....	3.33				6.25	651,179	9.58	.1
Total Pacific States.....	\$ 46.33	\$ 71.45		\$ 59.20	\$ 2.76	\$ 568,362,902	\$179.74	506.8
Hawaii.....	\$ 8.88	\$ 18.19			\$ 8.86	\$ 5,820,609	\$ 35.93	4.8
Porto Rico.....						3,364,042		
Philippines.....						24,553,079		
Total United States.....	\$ 73.10	\$ 27.47	\$ 20.80	\$ 35.50	\$ 1.92	\$12,357,477,376	\$158.79	10,785.6

For further details regarding each class of banks in the United States, as compiled by states, see articles NATIONAL BANKS, PRIVATE BANKS, STATE BANKS, SAVINGS BANKS, and TRUST AND LOAN COMPANIES.

and loans of \$2,831,479,771. The excess of deposits over loans in this geographical division and in the New England States is due to large investments in stocks, bonds, and other securities by savings banks. The deposits in banks in the Southern States amount to \$501,905,118 and loans to \$493,188,951; in the Middle States deposits aggregate \$1,720,073,957 and loans \$1,520,994,394; in the Western States the deposits in the banks are shown to be \$294,383,819 and the loans \$229,665,067; in the Pacific States deposits aggregate \$412,534,452 and loans \$200,198,156. Statistics were obtained on the same lines from 1 national, 3 other incorporated, and 2 private banks in Hawaii; 3 incorporated banks in Porto Rico, and 7 incorporated banks, including branches, in the Philippine Islands, making an aggregate of 16 institutions in these new Territorial possessions. The aggregate capital reported is \$4,313,978; surplus and undivided profits, \$1,627,250; deposits, \$23,018,602; and loans, \$13,908,262.

The table on the preceding page, compiled from figures published by the comptroller of the currency, shows by States the per capita resources of each class of banks and of all banks in the United States on or about June 30, 1901, and shows also the total resources of all banks in 1901, and the total resources, by millions, of all banks in the United States on or about June 30, 1900.

For further details regarding each class of banks in the United States, as compiled by States, see articles, NATIONAL BANKS, PRIVATE BANKS, STATE BANKS, SAVINGS BANKS, and TRUST AND LOAN COMPANIES.

National Banking Reserves and Legislation Recommended.—Particular interest always attaches to the percentage of reserve held to secure deposits. Banks in New York, Chicago, and St. Louis, which are required to hold a reserve equal to 25 per cent. of their deposit liabilities, held 26.16 per cent. Banks in twenty-nine reserve cities with the same requirement of reserve held 29.36 per cent., and banks outside of reserve cities, with a legal requirement of 15 per cent., held 27.56 per cent. of reserve. On its face, this return would seem to indicate great conservatism of management in regard to the security of deposits. The national bank law, however, allows reserve city banks to deposit 50 per cent. of their legal reserve with agents in the central reserve cities, and country banks to deposit 60 per cent. of their legal reserve with reserve agents in the thirty-two reserve cities. The figures of reserve held, therefore, contain a large proportion of claims against other banks. This is shown by the fact that taking the national banks as a whole the cash reserves held amounted to only 7.9 per cent. of the deposits. This is a poorer showing than the one made by State and private banks, which held on the same date a cash reserve equal to 9.4 per cent. of these deposits.

Comptroller Ridgely makes few recommendations in regard to legislation. He indorses the suggestion of his predecessor, Mr. Dawes, that the provisions of the law prohibiting the use of their power by national bank officers for personal purposes, should be made more stringent, and he recommends a modification of the provision of the national bank act, prohibiting national banks from loaning more than an amount equal to one-tenth of their capital stock to any one person. Mr. Ridgely takes strong ground in favor of a modification of the present regulations permitting the deposit of government funds in banks. "An examination of the records of all the national banks during the first thirty-six years of their operations shows that, if the surplus money in the treasury had been deposited in the banks of the clearing-house cities and the government had been given a first lien on the assets of these receiving banks, there would have been not one dollar of loss to the United States government; that is, the money would have been just as safe as it has been locked up in the vaults of the Treasury, and being thus kept in the banks, it might have formed the basis for loans on the part of the banks which would have been at times of great service."

Foreign Banks of Issue.—The condition of the principal foreign banks of issue on April 1, 1901, as reported by the *Bulletin de Statistique*, is as follows, in millions of francs (the franc equals 19.3 cents):

BANKS.	GOLD.	SILVER	TOTAL SPECIE.	CIRCULATION.	DEPOSITS, ETC.	MIN. RATE OF DISCOUNT.
Imperial Bank of Germany....			1,129.8	1,718.7	756.6	3½
Bank of Austria-Hungary.....	977.3	280.4	1,257.7	1,449.4	73.2	4
National Bank of Belgium.....			109.9	581.3	57.7	3
Bank of France.....	2,464	1,120.6	3,584.6	3,955.8	645.3	3
Bank of Italy.....	201	57.8	348.8	781	208.1	5
Bank of Russia.....	1,891.2	202.7	2,093.9	1,458.7	317.6	5
Bank of Spain.....	350.1	426.8	776.9	1,605.6	727.4	3½
Bank of England.....	960.4		960.4	749.7	1,022.2	3

BANTING. See OBESITY.

BAPTISTS are comprised in thirteen church organizations, agreeing on the cardinal points of baptism, though differing on other points; the three great bodies

of Regular Baptists (North, South, and Colored), however, are distinct, not in ecclesiastical differences, but in administration, each maintaining separate activities. The denomination, with over four and one-half millions of members, ranks, in the United States, next to the Roman Catholic and Methodist churches. According to the latest statistics published by Dr. H. K. Carroll, in the *Christian Advocate*, the strength of the various Baptist bodies is as follows: Regular Baptists (North), 7,537 ministers, 9,305 churches, and 1,005,613 communicants; Regular Baptists (South), 12,599 ministers, 19,799 churches, and 1,674,108 communicants; Regular Baptists (Colored), 9,916 ministers, 15,195 churches, and 1,590,802 communicants; Six-principle Baptists, 8 ministers, 12 churches, and 828 communicants; Seventh-day Baptists, 122 ministers, 116 churches, and 10,104 communicants; Free-will Baptists, 1,436 ministers, 1,522 churches, and 86,535 communicants; Original Free-will Baptists, 120 ministers, 167 churches, and 12,000 communicants; General Baptists, 484 ministers, 423 churches, and 24,775 communicants; Separate Baptists, 113 ministers, 103 churches, and 6,479 communicants; United Baptists, 25 ministers, 204 churches, and 13,209 communicants; Baptist Church of Christ, 80 ministers, 152 churches, and 8,254 communicants; Primitive Baptists, 2,130 ministers, 3,530 churches, and 126,000 communicants; Old-Two-Seed-in-the-Spirit Predestinarian Baptists, 300 ministers, 473 churches, and 12,851 communicants. The figures for the three Regular bodies are estimates (Dr. Carroll notes), as the returns for 1901 were not ready.

National anniversaries of the Northern Baptists, at Springfield, Mass., May 20-28, were marked by features commemorative of the first meeting of the century. A report from the joint committee appointed in 1900 in the interests of a union of the agencies of some of the various societies and consolidation of their work was heard, and led to the reference of the problem to future conferences. From the various activities of the church, home and foreign missions, including the work of the women's auxiliaries, the educational and publishing interests, statements of progress were received. About \$500,000 is expended on home missions among 20 nationalities of this country; a notable work in this department is that of the chapel-car service, an institution of 10 years' standing, and now representing an investment of \$100,000, which has been effective in organizing a number of churches and Sunday-schools, and also in philanthropic work. There are now six of these cars, each containing a chapel and parsonage, which are hauled and kept in repair by the railroad companies, though built and owned by the church. The publication society, under the auspices of which this last branch is conducted, reports an income of \$887,472. The American Baptist Missionary Society received nearly one million dollars for its work (including over \$400,000 from native churches) which embraces foreign fields in Burma, Assam, Southern India, West Africa, China, Japan, and the Philippines, in which fields there are 472 missionaries and 3,482 native helpers, 927 churches with 105,212 members, and 36,335 scholars in mission schools; and domestic missions in Alaska, Porto Rico, Cuba, Mexico, and among the Indians and negroes, in which are engaged 1,199 missionaries and teachers. There are also missions on the continent of Europe, and a large number of self-supporting churches in Asia and Africa, the missionary work of the church being directed toward establishing the independence of the churches that are organized. At the forty-sixth session of the Southern Baptist convention, in New Orleans, some dissatisfaction was expressed with the amount of offerings, as not proportionate to the members and wealth of the denomination; the discussion led to a consideration of the report of the committee on cooperation, one of the noteworthy features of the meeting. The Southern Baptist Missionary Conference reports 102 missionaries, 41 ordained and 130 unordained native helpers, and 127 churches in the several fields, which include China, Japan, Africa, Italy, Mexico, and Brazil. The twenty-first annual session of the National Baptist convention, held in Cincinnati, was noteworthy as one of the most successful in the history of the organization. Much interest was shown in the fact that during the past year \$129,000 had been realized for education. *The Ethics of Gambling* was a prominent topic at the nineteenth annual Baptist conference for the discussion of current questions, held in November, 1901, in New York City. A notable publication of the year 1901, in connection with the Baptist denomination, has been *A Century of Baptist Achievement*, edited by A. H. Newman, D.D., LL.D., recently elected president of Baylor University, Waco, Tex.

BAPTIST YOUNG PEOPLE'S UNION OF AMERICA, founded in 1891, is a denominational organization of the various young people's societies in the Baptist churches, the object of which is to stimulate activity along spiritual and missionary lines and to promote biblical and denominational education. A prominent feature of its methods is the work of the Christian Culture courses. The eleventh international convention, in Chicago, Ill., July 25-28, 1901, was marked by spirited addresses on current topics of interest; the meeting of 1902 will convene July 10-13, in Provi-

dence, R. I. The *Baptist Union* represents the interests of the society. President, John H. Chapman; headquarters, 324 Dearborn Street, Chicago.

BAR ASSOCIATION, AMERICAN, organized in 1878, is composed of the leading lawyers in the United States who meet annually to discuss matters of importance to the profession and to the community at large. Each State is represented by one vice-president. Membership, 1,700. President, V. M. Rose, Little Rock, Ark.; treasurer, Francis Rawle, Philadelphia, Pa.; secretary, John Hinkley, 215 North Charles Street, Baltimore, Md.

BARATIERI, General **ORESTE**, Italian soldier, died at Sterzing, in the Austrian Tyrol, August 8, 1901. He was born at Cordino, November 13, 1841, and saw service first with Garibaldi in the expedition to Sicily in 1860. In 1866 he was with Garibaldi again against the Austrians, and at the conclusion of that war joined the regular army and went to the Red Sea as colonel of Bersaglieri in 1888. He acted as governor of Erythrea, Italian East Africa, from 1892 to 1896, leading several successful expeditions against the Abyssinians until, just before he was recalled, he met with the disastrous defeat at Adowa, in March, 1896, at the hands of King Menelek, the Italian loss being 10,000 killed. For this he was court-martialed, on the charge of attacking an impregnable position under conditions rendering defeat inevitable, but was acquitted.

BARBADOS, a West Indian island constituting a British colony, has an area of 166 square miles and its estimated population in 1900 was 195,000. The colony is administered by a governor, Sir Frederic M. Hodgson, in 1901; legislation is effected by an appointed council and an elected assembly. The revenue and expenditure in 1899 were £216,022 and £207,883 respectively; in 1900 the revenue amounted to £185,475, of which over 75 per cent. was derived from customs and excises, while the expenditure was £182,866. The public debt, which has been incurred for the construction of public works, chiefly water supply, amounted to £416,850 at the end of 1900.

In 1899 the imports and exports amounted to £998,006 and £845,590 respectively; in 1900 the imports were valued at £1,045,251, of which nearly half came from Great Britain, and exports amounted to £919,011, of which £694,038 represented the produce of the colony, mainly sugar and its products. The sugar export, valued at £485,736 in 1900, goes mainly to the United States. In his annual report in 1901 the colonial secretary said: "The colony has thus far paid its way well, and the administration has every reason to be satisfied with the results of the year; . . . but it must be remembered that this result has only been obtained by the imposition during seven and a half months of 1900 of a tariff which doubtless pressed somewhat hardly on trade."

In October, 1901, a landslip extending over 500 acres occurred in the Boscobel district; many houses were wrecked, 85 being swept into the sea, roads and landmarks were effaced, and 400 people left homeless.

BARBIER, **PAUL JULES**, French librettist and playwright, died in Paris, January 17, 1901. He was born March 8, 1825. Besides writing the libretto for Gounod's *Faust* (1859), which is his best-known work, M. Barbier produced libretti for operas by Ambroise Thomas, Massenet, Meyerbeer, and others, and many original comedies. His principal works, aside from *Faust*, are libretti for Gounod's *Philemon et Baucis* (1860), *Roméo et Juliette* (1867), Thomas' *Mignon* (1866), *Hamlet* (1868), and *Françoise di Rimini* (1882), and the dramatization of *Néron* (1885), an original tragic poem, to music of Rubinstein. In collaboration with M. Carré he wrote numerous libretti for the Opera Comique, the most successful being the book for Massé's *Paul et Virginie* (1876). M. Barbier also published a volume of patriotic verse and two volumes of poems. He was an officer of the Legion of Honor from 1865.

BARLEY. As reported by the United States Department of Agriculture, the barley crop by countries in 1900 was as follows:

	Bushels.		Bushels.
Russia	236,981,000	Canada	22,975,000
Germany	137,889,000	Denmark	21,000,000
Austria-Hungary	118,750,000	Sweden	14,786,000
Great Britain and Ireland....	70,700,000	Mexico	10,000,000
United States	58,926,000	Italy	7,000,000
Spain	55,000,000	Australasia	3,730,000
Japan	44,000,000	Netherlands	3,500,000
France	43,612,000	Belgium	3,000,000
Algeria, Tunis, and Cape Colony	41,800,000	Total	919,224,000

The imports of barley into the United States in 1900 were 189,612 bushels (valued at \$91,040), of which nearly the whole were exported from Canada. In 1901 the imports amounted to 171,004 bushels (valued at \$84,073), of which 170,512 bushels (valued at \$83,705) came from Canada. In 1897 the imports were 1,271,787 bushels (valued at \$394,749). The exports in 1900 were 23,661,662 bushels (valued at \$11,216,694) and in 1897, 20,030,301 bushels (valued at \$7,646,384). The exports in 1901 amounted to 6,293,207 bushels (valued at \$2,883,565); the principal part was sent to Great Britain (4,880,573 bushels, valued at \$2,180,524); Belgium took 436,321 bushels (valued at \$202,401). The other countries receiving important shipments of barley are Germany, the Netherlands, and Hawaii. In the United States the acreage in 1900 was 2,894,282 acres, the yield 20.4 bushels an acre, the farm price 40.8 cents a bushel, and the farm value of the crop \$24,075,276. The results of 10 years' experiments in sowing barley at different dates at the Canadian Experimental Farms have uniformly resulted in favor of the sowing made about one week after the ground is in such condition that sowing is practicable. Barley has been successfully matured during the past three years at the agricultural experiment stations at Sitka and Kenai (in Cook Inlet), Alaska, and also in 1901 at Rampart in the Yukon Valley.

At the Ontario Agricultural College and Experimental Farm, Laritz reports that Manchury barley has been compared with the widely cultivated common 6-rowed barley for 12 years, and the results show an average yield of 66.8 bushels of grain and 1.6 tons of straw an acre for the Manchury and 57.6 bushels of grain and 1.6 tons of straw for the common 6-rowed. The average results for several years show that the best 2-rowed barley yielded about 14 bushels an acre less than the best 6-rowed variety. The Manchury variety, which was introduced into the United States from Asia by the Wisconsin Experiment Station, is now grown over a wide range of territory in this country and has been of great financial benefit to the farmers producing this crop. Von Seelhorst and N. Georgs have reported the results of an important pot experiment on the influence of different fertilizers and the water content of the soil upon the form and composition of the barley plant. They found that supplying the element or elements of plant food which are present in the soil in only minimum quantities, favors the development of the roots as well as of the parts of the plant above ground, and that the increase of organic substance in the soil due to the development of the roots has a beneficial effect on the succeeding crop. It was noticed that the low-water content of the soil induced a greater development of the root system, and attention is called to the fact that an increase in root development means a withdrawal of plant food from the other parts of the plant. The application of nitrogenous fertilizers when only a small amount of nitrogen was present in the soil, together with a high soil humidity, favorably influenced the stooling of the plant. An increase in the humidity of the soil without the application of nitrogen increased the strength of the stalk, shortened the heads and reduced their weight, but when nitrogen was used at the same time that the humidity of the soil was increased stronger stalks and longer and heavier heads were produced. Examination of the grain led to the conclusion that on dry soils nitrogenous fertilizers tend to increase the nitrogen content of the grain, but that there is less danger of producing barley too rich in nitrogen for brewing purposes by the use of nitrogen in fertilizers when the soil is moist.

An examination of the weight of the grain of barley, oats, rye, and wheat as related to the climate of the region in which the crop was grown was made by Jensen in Denmark on the basis of samples received from the United States and twelve European countries. He found that the grain weight was greater in regions with a coast or insular climate and also that it increased with increasing temperature.

BARNARD COLLEGE, New York, organized 1889, a woman's college, being an integral part of Columbia University (*q.v.*).

BAR OF THE CITY OF NEW YORK, THE ASSOCIATION OF THE, organized in 1869 and incorporated 1871, had, at the last report of the executive committee, 1,663 members. The association has had, during its existence, the following presidents: William M. Evarts, 1870-79; Stephen P. Nash, 1880-81; Francis N. Bangs, 1882-83; James C. Carter, 1884-85; William Allen Butler, 1886-87; Joseph H. Choate, 1888-89; Frederick R. Coudert, 1890-91; Wheeler H. Peckham, 1892-94; Joseph Laroque, 1895-96; James C. Carter, 1897-99; John E. Parsons, 1900-01. The association owns and occupies a commodious building at No. 42 West Forty-fourth Street, New York City, and has a valuable law library of over 53,000 volumes. The admission fee is \$100, and the annual dues for resident members \$50 and for members non-residents but having offices in the city \$25. A member who does not reside and has no office in New York is exempt from the payment of annual dues. President, John E. Parsons; recording secretary, S. R. Brownell; treasurer, S. Sidney Smith.

BARON DE HIRSCH FUND, a trust fund created in 1889 by Baron Maurice de Hirsch for the benefit of Jewish Russian-Roumanian emigrants to America;

capital, \$2,500,000; annual income, \$100,000. The main scope of the work is: To provide for the reception of emigrants and assist them in getting a start in life; to teach habits of thrift and self-support in this country; provide day and night schools for children and adults; furnish mechanics with tools and teach them how to use them; make advances by way of loans and furnish transportation to centres of employment. The fund also maintains the Baron de Hirsch English day school in the Educational Alliance building, 193 East Broadway, N. Y., an evening English school at the same address for Russian men and women who work during the day, and the Baron de Hirsch trade school at East Sixty-fourth Street, where young men are taught useful mechanical trades—machine work, plumbing, carpentry, electrical construction, sign and house painting, etc.—under E. G. Yalden, superintendent. The Jewish Colonization Society is in active cooperation with the fund. Attendance at the English schools, both day and night, is about 650. President, Myer S. Isaacs; treasurer, Emanuel Lehman; general agent, A. S. Solomans; headquarters, 45 Broadway, New York City.

BARTON, EDMUND, Australian statesman, was appointed premier of the new Australian commonwealth and minister for foreign affairs in 1901. He was born at Glebe, Sydney, New South Wales, January 18, 1849, and was educated at the Sydney grammar school and university, being called to the bar of that city in 1871. He was first elected to the legislative assembly in 1879, and from 1883 to 1887 served as speaker, afterwards entering the legislative council. In 1889 he was attorney-general, being reelected in 1891, and was a member of the federal convention which met at Sydney. From that time forward he was one of the most active supporters of the federation scheme, going as the senior representative to the convention of 1897, and taking the leading part in the proceedings until the Federal Constitution bill was adopted. For a time he was the leader of the opposition in the New South Wales parliament, but resigned that post to devote himself entirely to the cause of federation. In 1900 he went as a delegate to England to support the constitution bill, where he attracted notice by his able advocacy of the cause. Upon the failure of Sir William Lyne, who had been called upon by the new governor, Lord Houghton (*q.v.*), to form a ministry, Mr. Barton was selected to create a cabinet. He is a protectionist in politics, and an ardent supporter of nationalism. See **AUSTRALIA**, **COMMONWEALTH OF** (paragraphs on History).

BARYTES. The production in the United States in 1900 amounted to 67,680 short tons, valued at \$188,089, as against 41,894 tons, valued at \$139,528 in 1899. The increase in production was due to the development of new properties in Tennessee. The average price, however, declined from \$3.33 in 1899 to \$2.78 in 1900. The imports had a total value of \$32,461. Barytes is used in the manufacture of mineral paint.

BASEBALL. Mismanagement in professional baseball, which was notorious in 1899 and 1900, and became even worse in 1901, threatens to destroy popular interest in the national game. In the National League contests, the games won, the games lost, and the percentages respectively, were as follows: Pittsburg, 90, 40, 647; Philadelphia, 83, 57, 592; Brooklyn, 79, 57, 580; St. Louis, 76, 64, 544; Boston, 69, 69, 500; Chicago, 53, 86, 381; New York, 52, 85, 379; Cincinnati, 52, 87, 373. Similar figures for the American League were: Chicago: 83, 53, 610; Boston, 79, 57, 581; Detroit, 74, 61, 548; Philadelphia, 74, 62, 544; Baltimore, 68, 65, 511; Washington, 61, 72, 459; Cleveland, 54, 82, 397; Milwaukee, 48, 89, 350.

In contrast with professional baseball in 1901, college baseball flourished in all sections, with honors divided between Princeton and Harvard. These teams did not meet. The remainder of the first twelve teams may be ranked: 3, Pennsylvania; 4, Yale; 5, Brown; 6, Cornell; 7, Dartmouth; 8, Amherst; 9, Williams; 10, Lafayette; 11, Wesleyan; 12, Lehigh. Princeton won 19 games and lost 2; Harvard won 18 and lost 2; Yale won 20 and lost 8. Yale and Princeton played three games, in which Princeton made 28 runs and Yale 16; Harvard v. Yale's two games resulted: Harvard 10 runs and Yale 3; Harvard v. Pennsylvania's two games resulted: Harvard 21 and Pennsylvania 6. In the Triangular League—Amherst, Williams, and Wesleyan—Amherst won 5, lost 3; Williams won 4, lost 4; Wesleyan won 3, lost 5. West Point played Annapolis for the first time and won by a very narrow margin. The University of Pennsylvania defeated Cornell, 14 to 4; Georgetown, 8-4; Brown, 8-2 and 4-3; but lost to Harvard, 3-11.

A uniform effort on the part of the faculties of Harvard, Yale, and Princeton, and the Intercollegiate Association of the South, sensibly diminished the number of players on college teams, who have become quasi-professionals by accepting board and other expenses for playing during the summer vacations.

BASKERVILLE, CHARLES, professor of chemistry in the University of North Carolina, announced in 1901 the discovery of a constant unknown impurity found in monazite, to which, in case it should prove a new element, he has provisionally as-

signed the name of "Carolinium" (see CHEMISTRY). Dr. Baskerville was born in Noxubee County, Miss., June 18, 1870, and studied at the universities of Mississippi and Virginia, graduating from the latter in 1890. Subsequently he pursued graduate studies at the University of Berlin, from which he received the degree of Ph.D. in 1893. In 1891 he became connected with the teaching staff of the University of North Carolina, and in 1900 was made professor of chemistry and director of the laboratories. He has served as secretary of the council and general secretary of the American Association for the Advancement of Science, being an active member of the section of chemistry. He is a member of the leading chemical societies of the world.

BASKET BALL. The championship in basket ball in 1901 was won by the Pratt Institute (Brooklyn) team. The game was played in 1900-01 by the universities of Princeton, Pennsylvania, Columbia, Harvard, and Yale, and by numerous schools and teams of the Y. M. C. A., with whom it is a favorite gymnasium game.

BASUTOLAND, an inland colony of Great Britain lying between Natal, Cape Colony, and the Orange River Colony. It has an estimated area of 10,293 square miles and an estimated population of 250,000. No Europeans are allowed to settle in Basutoland without the permission of the government. There are four government schools and 177 private schools, with over 11,000 pupils, of whom about 90 per cent. are educated under the supervision of the French Protestant mission. The principal products are grain, wool, and cattle. In the fiscal year 1900 the revenue and expenditure amounted to £69,769 and £59,492 respectively, and the exports were valued at £133,861 and the dutiable imports at £85,527.

BATCHELDER, RICHARD NAPOLEON, brigadier-general U. S. A. (retired), died in New York City, January 4, 1901. He was born at Lake Village, N. H., July 27, 1832, and at the outbreak of the civil war entered the volunteer service as first lieutenant in the First New Hampshire regiment. Soon afterwards transferred to the quartermaster's department, he remained there throughout the war, being brevetted brigadier-general, March 13, 1865. Later he entered the regular service as captain and assistant quartermaster, and rose to be quartermaster-general, with the rank of brigadier-general, retiring in 1896. During the war General Batchelder was present at many important engagements, and was awarded a medal of honor for his services as quartermaster with the Army of the Potomac. While quartermaster-general he instituted many innovations and reforms, to the great improvement of the service.

BATH HOUSES, MUNICIPAL. See MUNICIPAL BATH HOUSES.

BATTERSON, JAMES GOODWIN, American builder, died at Hartford, Conn., September 18, 1901. He was born at Bloomfield, Conn., February 23, 1823, and was trained in his father's business, that of stone-cutting. As head of the New England Granite Works, Mr. Batterson erected many notable monuments and public buildings, including the national monument at Gettysburg, the statue of Alexander Hamilton in Central Park, New York City, soldiers' monuments at Antietam and Galveston, and the Halleck monument at San Francisco. The most notable of the buildings erected by him are the Congressional Library at Washington and the Connecticut State Capitol at Hartford. In 1858-59 he was in Egypt with Brunel, and became interested in engineering problems, geology, and Egyptology, and was a recognized authority in this last subject, being honorary secretary of the Egyptian Exploration Fund.

BATUM PIPE LINE. See RUSSIA.

BAUXITE. The production of bauxite, which is used in the production of aluminum, in 1900 amounted to 23,184 long tons, valued at \$89,676, as compared with 35,280 long tons, valued at \$125,598 in 1899. The deposits in the Georgia-Alabama district are rapidly giving out, while Arkansas, which began producing in 1899, promises to be of great importance. C. W. Hayes (*The Bauxite Deposits of Arkansas*, United States Geological Survey 21st Annual Report, part III.) states that the Arkansas deposits are confined to an area of 20 by 5 miles lying southwest of Little Rock. He estimates that in the outcrops alone there are 608,500 long tons of bauxite in sight, while the total quantity under cover is 43,711,200 long tons. Several of the companies that have been operating in Georgia have moved to newly purchased bauxite property in Arkansas. See ALUMINUM and CRYOLITE.

BEACH, WILLIAM WITHER BRAMSTON, British legislator, died in London, August 3, 1901. He was born in Hants, England, December 25, 1826, and was educated at Eton and Oxford. Elected first a Conservative member of parliament in 1857, he sat continuously as a representative for North Hants until the redistribution of seats in 1885, when he was sent from Andover. Mr. Beach was made a privy councillor in 1900, and since 1899 he was known as the "father of the House of Commons."

BEAMISH, HENRY HAMILTON, C.B., British rear-admiral, died at Brasted, Kent, England, July 19, 1901. He was born in Buckinghamshire in 1829, and entered the navy in 1845, after being privately educated. After serving in India (1851-53), in the Baltic during the Russian war of 1854-55, in the China seas, as naval aide-de-camp to Lord Elgin at the capture of Canton, and at the capture of the Peiho forts (1858), he was promoted to commander, and received the China medal with clasps. He also saw service on the west coast of Africa, in conflict with slavers.

BECHUANALAND PROTECTORATE, a British protectorate situated between the Zambesi River, the Transvaal, Cape Colony, and German Southwest Africa. It has an estimated area of 213,000 square miles and an estimated population of 200,000. The natives are ruled by their own chiefs, under the ultimate control of a resident commissioner appointed by the high commissioner for South Africa. The principal products are maize, wool, cattle, and hides, which are exported in considerable quantities. Revenue is derived chiefly from customs duties and the native hut tax. In 1897 the revenue amounted to £47,511 and the expenditures to £88,448. Order is preserved by a mounted police force of about 150 men.

BECKER, GEORGE FERDINAND, American geologist, was made a member of the National Academy of Sciences at its spring meeting in 1901. Dr. Becker was born in New York, January 5, 1847, and after graduating at Harvard in 1868 pursued further studies in Europe, taking the degree of Ph.D. at Heidelberg in 1869 and two years later passing the examination of the Royal School of Mines in Berlin. In 1875 he became an instructor in the University of California, and four years later joined the United States Geological Survey, where the greater part of his scientific work has been accomplished. He was a special agent for the tenth census, and has conducted numerous investigations for the government. Chief of these have been the examination of the gold mines of South Africa and the geological condition of the Philippines. For this latter purpose he was assigned to the army of occupation, and he prepared a valuable and comprehensive report on the mineral deposits of the islands. Dr. Becker is at present in charge of the division of chemical and physical research of the United States Geological Survey. He is the author of *The Geology of the Comstock Lode*; *Statistics and Technology of Precious Metals* (with S. F. Emmons); *Report on the Gold Fields of South Africa*, the *Southern Appalachians*, and *Alaska*; and *Report on the Geology of the Philippines*.

BEET SUGAR. See SUGAR INDUSTRY.

BEHRING, DR. EMIL ADOLF, the German physician who received the Nobel prize (*q.v.*) in medicine in 1901 for his discovery of the serum of diphtheria, was born at Hansdorf, in the province of West Prussia, March 15, 1854. After being educated at the Imperial Military School of Medicine in Berlin, he became an assistant surgeon in the army in 1880. In 1883 he joined a regiment of cuirassiers in Silesia, and in 1887 was made a surgeon of the first rank at the military post at Bonn. A year later he joined the faculty of the Berlin Military School, at the same time becoming a lecturer at the Hygienic Institute. In 1894 he was appointed a lecturer on hygiene at Halle, and the following year he removed to Marburg to take a similar position, and resigned from the army. In 1896 he was appointed to the Marburg board of health. Besides his achievements in the investigation of diphtheria, he has won prominence in the study of tetanus, and for his work in these subjects he received from the Paris Academy of Medicine one-half of a special prize of 25,000 francs, and also one-half of the Alberti Levi prize of 50,000 francs from the Paris Academy of Science. He has published *Die Blutserumtherapie* (1892); *Gesammelte Abhandlungen zur ätiolog. Therapie von ansteckenden Krankheiten* (1893); *Die Geschichte der Diphtherie* (1893); and *Bekämpfung der Infektionskrankheiten* (1894).

BELGIUM, a constitutional monarchy of western Europe lying south of the Netherlands and bordering the North Sea. The capital is Brussels.

Area and Population.—The aggregate area of the nine provinces comprising Belgium is 11,373 square miles. The population, according to the census of December 31, 1890, was 6,069,321, and according to the official estimate of December 31, 1900, 6,815,054; of the latter number 3,398,997 were males and 3,416,157 females. The annual birthrate is 29 and deathrate 20 per 1,000, and the immigration exceeds the emigration. At the end of 1900 Antwerp had 285,600 inhabitants; Brussels, 211,449 (with suburbs, over 570,000); Liège, 173,706; Ghent, 160,049. The immigrants and emigrants in 1898 numbered 27,393 and 22,860 respectively, and in 1899 26,364 and 22,957 respectively. Almost the entire population is Roman Catholic. At the beginning of 1899 there were 6,694 public primary schools with 774,989 pupils, 128 public secondary schools with 22,870 pupils, and 35 public atheneums and colleges with 7,440 students. In addition, there were 2,065 public infant schools with 194,807 pupils, 2,299 public adult schools with 102,531 pupils, and 57 public normal schools with 3,848 students. There are four universities—Louvain, Liège, Ghent, and Brussels.

Government.—The executive authority is vested in the king, who is assisted by a ministry whose members are appointed by him and are responsible to the chamber of representatives. The king is Leopold II., who ascended the throne in December, 1865. The legislative power devolves upon the king and a parliament consisting of a senate and a chamber of representatives. In 1901 the premier and minister of finance and public works was M. de Smet de Nayer (appointed August 5, 1899); minister of foreign affairs, M. Paul de Favereau (appointed February 25, 1896); minister of the interior and instruction, M. de Trooz (appointed August 5, 1899); minister of war, General Cousebant Alkemade (appointed August 5, 1899).

Army.—The regular army is formed by conscription, the annual contingent being about 13,500 men. The peace strength of the army in 1901 was 51,448, of whom 3,666 were officers; the infantry numbered 1,921 officers and 27,788 men, the cavalry 370 officers and 5,770 men, and the artillery 633 officers and 8,682 men. The strength of the army on a war footing is placed at 143,000 men. There is a national guard numbering upward of 40,000. For the army bill under consideration by the parliament in 1901, see paragraph on Army Reorganization.

Finance.—The Belgian unit of value is the franc, worth 19.3 cents. Revenue accrues largely from railways, taxation, excise, and customs; the largest items of expenditure are for railways and interest on the public debt. The ordinary revenue and expenditure in 1898 amounted to 439,281,906 francs and 427,180,956 francs respectively; estimates for subsequent years have been: 1899, revenue, 469,000,833 francs and expenditure 451,427,566 francs; 1900, 492,553,500 and 480,531,928; 1901, 488,429,760 and 488,047,973. The national debt, including charges, stood at 2,657,900,000 francs at the end of 1899 and 2,708,500,000 francs at the end of 1900. Almost the entire debt has been devoted to public works, especially the construction of state railways.

Industries.—Belgium is essentially a manufacturing country, though mining, especially coal and iron, and agriculture are of some importance. The principal crops are oats, rye, wheat, potatoes, and beets. The following figures are for 1899: Coal raised, 22,072,068 tons (metric), valued at 274,400,000 francs; iron ore, 201,445 tons; manganese ore, 15,120 tons; cast iron produced, 1,024,576 tons, valued at 74,400,000 francs; steel wares manufactured, 633,950 tons, 96,100,000 francs; iron wares, 475,198 tons, 76,400,000 francs; zinc products, 122,843 tons, 74,600,000 francs; glass wares, 76,300,000 francs; lead products, 5,900,000 francs; quarry products, 55,400,000 francs; raw sugar, 188,026 tons; refined sugar, 66,725 tons; beer, 1,370,634 hectolitres. There are factories for the production of textiles, laces, leather goods, etc.

Commerce.—The special trade of Belgium has been reported as follows: 1898, imports and exports, 2,044,700,000 francs and 1,787,000,000 francs respectively; 1899, imports 2,260,200,000 francs and exports 1,949,300,000 francs; 1900, imports 2,215,800,000 francs and exports 1,922,400,000 francs. Statistics for the first nine months of 1901 showed that, notwithstanding a so-called industrial crisis, the value of the imports was 2 per cent. greater than that for the corresponding period of 1900; a decrease of 2 per cent., however, was noted in the exports. In order of importance the leading countries exporting to Belgium are France, Great Britain, Germany, the United States, Netherlands, and Argentina; while the most important countries receiving Belgian products are, in order: Germany, Great Britain, France, and Netherlands. The values in francs of the principal imports (special trade) in 1899 were: Cereals, 338,039,000; raw textiles, 288,189,000; metals, 119,317,000; resins, etc., 96,380,000; minerals, 88,644,000; chemicals and drugs, 71,444,000; raw hides, 70,010,000. Similar figures for exports were: Raw textiles, 164,599,000; cereals, 109,743,000; iron, 88,378,000; glass, 87,829,000; raw and tanned hides, 72,762,000; chemicals and drugs, 70,954,000; tissues, 62,969,000; machinery, carriages, etc., 47,671,000; raw and refined sugar, 45,086,000.

Communications.—Belgium has over 5,700 miles of public roads and nearly 1,400 miles of navigable rivers and canals. At the end of 1899 there were open for traffic 2,850 miles of railway, of which the state operated 2,521 miles.

HISTORY.

The Suffrage Question.—The year 1901 was marked in Belgium by long and heated parliamentary discussions regarding various reforms, with very little legislation resulting therefrom. Propositions for a reform of the suffrage consumed more time than any other, and threatened to disrupt the forces of the opposition, comprising the Liberals, the Progressists or Radicals, and the Socialists, who had come together on a common anti-clerical platform in 1900. The position taken by the Liberals and Socialists in favor of proportional representation had practically forced the Clerical majority to consent to a law providing for that reform in connection with parliamentary elections. As a result, the reformed Parliament chosen in 1900 had shown an increase in the Socialist and Liberal members of over 65 per cent.

The programme proposed by the Socialists and Progressists at the opening of the session of 1901 was the abolition of plural voting, the establishment of universal suffrage, and the extension of proportional representation to the communal elections. The Liberals, who had obtained control of the city governments in Brussels, Antwerp, Ghent, and other cities by means of the plural voting, at first refused to accede to any programme which would alter in any degree the situation in the communes, but finally, coming to the conclusion that the Clerical party would never agree to a law providing for universal suffrage while it maintained a majority in Parliament, agreed, for the sake of harmony, to join the other elements of the opposition in a general demand for reform of the suffrage. In July the opposition united in a demand for a fairer apportionment of electoral districts, and declared their intention of throwing light on the "fraud" which enabled the Clerical party to disfranchise over 100,000 heads of families. The debates showed a disposition on the part of all elements of the opposition to favor a general revision of the constitution, but a Progressist proposal for a referendum on the question of plural suffrage and a declaration of the Socialists favoring woman's suffrage received very little support.

The Anti-Gambling Measure.—A bill for the suppression of licensed gambling places, introduced in February, 1901, was before Parliament in one shape or another for the greater part of the year. Belgium has been for some time, with the exception of Monaco, the only country where gambling has been licensed by the state, and there has been considerable agitation in the past few years looking toward its suppression. The bill as originally introduced in the senate provided for the prohibition of gambling in public places where stakes were generally known, or where their importance was sufficient to make them a motive for gain. Special dispensation was provided for the notorious gambling places at Ostend and Spa. The lower house rejected the latter proposition and sent the bill back to the senate, where amendments destroying its usefulness were made. After that the bill passed back and forth between the senate and the chamber until late in December, the senate holding out for privileges or remuneration for the gambling corporations at Ostend and Spa and the lower house insisting on their unqualified suppression. The chamber finally triumphed and the bill was passed.

Army Reorganization.—The army reorganization bill was another measure that took up a considerable part of the Parliament's time. The reform measure as proposed by the government increased the war strength from 145,000 to 180,000, and the annual contingent from 13,500 to 18,000. Volunteering was to be encouraged by decreasing the term of service and paying those who could not afford to give their time, and the privilege of substitution (*remplacement*) among those drawn by conscription was to be curtailed. This bill was opposed by a strong anti-militarist combination in Parliament, but there was no union on any one plan. Numerous schemes were laid before the chambers, but few received any concerted support, although the tendency of all was to increase the volunteer character of the army, and do away with conscription as much as possible. In October, 1901, the Progressists and Socialists agreed on a bill which provided for the absolute abolition of substitution and of drawing by lot, and for the prohibition of special exemption for the rich. A radical reduction in the term of service was proposed. The bill was still under discussion at the end of the year.

Other Events of the Year.—Late in December the government Sugar Bounty bill, providing for a bounty of 2 francs per 100 kilometres up to a total of 5,000,000 francs annually, was passed by the chamber. The question of the annexation of the Congo Free State (*q.v.*) was left in *statu quo*, Parliament merely reaffirming its right of option to annex the state, and leaving it to the king to decide when this should take place. On November 3, 1901, a son and heir was born to Prince Albert, the heir apparent (who married the Princess Elizabeth, of Bavaria, in October, 1900), thus insuring an heir to the throne in direct line. Late in May the Charleroi glassmakers' strike, which had been maintained since August 1, 1900, was terminated by the decision of the strikers to resume work. The strike, which involved a loss in wages of nearly \$2,500,000, was the longest industrial struggle that has occurred in Belgium. As its chief object was to compel the operators to employ only union laborers, the outcome must be considered a signal victory for free labor. An old-age pension law enacted in 1900 became operative on August 1, 1901. There were at that time 165,000 applicants for the annual 65-franc pension.

BELIZE. See BRITISH HONDURAS.

BELKNAP, CHARLES, commander U. S. N., died at Baltimore, Md., June 15, 1901. He was born at Jersey City, N. J., August 25, 1846, entered the navy as a midshipman in 1864, and graduated at the Naval Academy in 1867. Appointed lieutenant (1871), he was on duty at the Naval Academy until 1876, when he went to the Asiatic station, returning again to the Academy in 1879. In 1889 he was promoted to lieutenant-commander, and served at Newport (1891) and again at the

Naval Academy (1894). He was made commander in 1896, and was sent to the Academy again in 1897, from which he was detached to command the collier *Nero*, in the Spanish-American war. At the close of the war he was assigned to the command of the training-ship *Dixie*, and at the time of his death he was the senior member of the board for the examination of warrant officers at the Washington navy yard.

BELL, ROBERT, F.R.S., was appointed in 1901 director of the Geological Survey of Canada, succeeding the late Dr. G. M. Dawson (*q.v.*). He was born at Toronto, June 3, 1841, and at the age of 15 became connected with the Geological Survey of Canada, serving as assistant for three years, and at the same time studying at McGill University. In 1860 he was made an active member of the survey, and since that time has surveyed and explored in the Gaspé peninsula, the Saguenay and Lake St. John country, the region about the Gulf of St. Lawrence, Newfoundland, Nova Scotia, and New Brunswick, and has traveled completely around the Labrador peninsula. In the western and northern regions of the Dominion Dr. Bell has been no less active and has been termed "the place-name father" of Canada, inasmuch as he has had to give names to new and unexplored regions. He was medical officer, geologist, and naturalist on the *Neptune*, Hudson Bay expedition in 1884, and accompanied the *Alert* expedition in 1885 and the *Diana* expedition in 1897 in a similar capacity. He received the degree of LL.D. from Queen's University, Kingston, in 1883, and enjoys the reputation of being one of the foremost of American explorers.

BELOOCHISTAN, or BELUCHISTAN. See BALUCHISTAN.

BENOIT, PIERRE LEOPOLD LEONARD, Belgian composer, died at Antwerp, March 5, 1901. He was born August 17, 1834, at Harlebeke, in West Flanders, and received his musical education at the Conservatory of Brussels. At his graduation in 1857 he won the royal prize for composition, which enabled him to visit and study at the musical centres of Germany, where he was a pupil of Wagner and Liszt. He studied also in Paris, and after his return to Belgium devoted himself to composition, which, while it achieved his fame, does not represent his value as a musician. His life-work was to establish and perfect a national style of composition, which he did with fair success. In 1867 he saw the Flemish School of Music founded at Antwerp as a result of his energy, and was its director from then until 1899. Some of M. Benoit's works are: *Le Roi des Aulnes* (1861), an opera; and *Lucifer* (1866); *L'Escout* (1869), and *La Guerre* (1873), oratorios.

BERMUDA, a group of small islands in the north Atlantic constituting a British colony, has an area of about 20 square miles and an estimated civilian population in 1901 of 17,535, of whom 6,383 were whites. The chief town is Hamilton (population about 2,200). The average number of imperial troops in Bermuda is about 3,000. The colony is administered by a governor, General George Digby Barker, since 1896; there is a representative legislative assembly. The public debt at the end of 1900 was £49,600; the revenue for that year was £40,124, as against £39,955 for 1899, and the expenditures £47,532, as against £39,243 for the preceding year. In 1900 the imports, of which about 60 per cent. came from the United States and 25 per cent. from Canada, amounted to £397,136 (£394,388 in 1899), and the exports, which went almost entirely to the United States and consisted chiefly of onions, potatoes, and lily bulbs, were valued at £93,769 (£119,151 in 1899). The average number of American visitors to Bermuda is about 3,000 yearly.

BERNARD, Sir CHARLES EDWARD, British-India official, died at Chamounix, France, September 16, 1901. He was born at Clifton, England, in 1837, and was educated at Rugby and Addiscombe. In 1858 he was appointed to the Bengal civil service, serving first in the Punjab as assistant commissioner, and becoming in 1869 commissioner of Nagpur. After occupying numerous minor posts in various Indian provinces, he became in 1878 secretary to the government of India in the Home Department, and three years later filled a similar office in the Revenue and Agricultural Department. From 1880 to 1888 he was chief commissioner of British Burma, and from 1888 to March, 1901, he served as secretary in the Revenue and Statistics Department of the India Office.

BERNHARDT, SARAH (BERNARD, ROSINE), French actress, who made a tour of the United States with M. Constant Coquelin (*q.v.*) in 1901, and played in a repertoire including *L'Aiglon*, *Fédora*, *La Tosca*, and *Hamlet*, was born in Paris, October 22, 1844, of Jewish parentage. A part of her childhood was spent with her grandfather, an optician of Amsterdam, and she was then placed in a convent at Versailles, where she became interested in the study of the stage. At fourteen she entered the Paris Conservatoire, where she won prizes both in comedy and tragedy parts, and in 1862 made her début as Iphigénie in Racine's tragedy at the Théâtre Français. In the same year she acted the leading rôle in Scribe's *Valérie*. But her success in these parts was doubtful, and she retired for further study, acting only in burlesque until 1867, when she took up legitimate comedy. In this field her first

great success was won in the rôle of the Queen in *Ruy Blas* at the Odéon, after which she was recalled to the Théâtre Français. Here she remained until 1880, when, after a tour of Europe and America, she established herself (1883) at the Théâtre Porte Saint Martin. In 1893 she became director of the Théâtre de la Renaissance, and in 1898 built the Théâtre Sarah Bernhardt. In 1882 she married M. Jacques Damala, from whom she was divorced in the following year. Mme. Bernhardt has won success in so many rôles that it is impossible to single out one of her creations as the greatest. Among those most familiar may be mentioned her Phédre, in the play of the same name; Dona Sol, in *Hernani*; Mistress Clarkson, in *l'Etrangère*; Fédora, in Sardou's play of the same title; parts in *Frou-Frou* and *La Dame aux Camélias*; Hamlet, in a French version of Shakespeare's tragedy, and L'Aiglon, in Rostand's play of that name. Previous to 1901 she had made three visits to the United States—in 1880, 1887, and 1891. She is a sculptor of some attainment, having won an honorable mention in 1876, and a silver medal at the Paris Exposition of 1900. A number of her paintings have been exhibited at the Salon, and she has written several plays, one of which, *l'Aven*, was produced at the Odéon in 1888. She has published novels serially in newspapers, and a volume descriptive of a balloon voyage under the title, *Dans les nuages, impressions d'une Chaise* (1878).

BERTHELOT, PIERRE EUGÈNE MARCELIN, the French organic chemist, celebrated, on November 24, 1901, the fiftieth anniversary of the publication of his first memoir by meeting a gathering of the most famous men of science of France at the Sorbonne, in Paris. M. Berthelot was born October 25, 1827, and after graduating at the College of Henry IV., where he won distinction in philosophy and history, as well as in science, was, in 1851, appointed an assistant in chemistry at the College of France, a place which he retained for nine years. While there he was chiefly concerned with the problem of producing by artificial means substances which had before been regarded as purely the product of nature. One of his achievements was the production of alcohol from illuminating gas and water; and this was followed by a series of important experiments on the synthesis of the carburets of hydrogen. The results of these experiments M. Berthelot published in 1858, and three years later he was awarded a prize of 3,500 francs by the Academy of Sciences. In 1862 he succeeded in effecting the direct combination of carbon with hydrogen, forming acetylene. Meanwhile, in 1859, he had been made professor of organic chemistry in the College of Pharmacy, and upon the creation of a similar chair in the College of France in 1865 was installed as its permanent incumbent. From that time he devoted himself wholly to the investigation of his special branch of chemistry, coming to be regarded in time as the practical creator of chemical mechanics, or thermo-chemistry. He was among the first to succeed in liquefying gas. In 1881 he was made a senator for life by the French government; five years later he served for a few months as minister of public instruction in the Goblet cabinet, and in 1895 he held the portfolio of foreign affairs in the Bourgeois cabinet. M. Berthelot is a member of nearly all the scientific societies of Europe, and recently he was chosen a member of the French Academy. His published memoirs number over six hundred, and his contributions to periodical literature have been numerous.

BESANT, Sir WALTER, English essayist and novelist, died in London, June 9, 1901. He was born at Portsmouth, England, August 14, 1836, and was educated at King's College, London, and at Christ's College, Cambridge, graduating from the latter in 1859. Appointed senior professor at the College of Mauritius, French Island of Mauritius, East Africa, in 1861, Mr. Besant remained there for six years. Ill health necessitated his return to England, where he devoted his energy to writing, and in 1868 his first book, *Studies in Early French Poetry*, appeared. From this time to 1874 he was a frequent contributor to various newspapers and periodicals, forming (1871) a literary partnership with James Rice, which was one of the happiest known to letters. This alliance remained unbroken until Rice died in 1882, and among the books that resulted may be mentioned *The Golden Butterfly* (1876); *Ready Money Mortiboy* (1872), and *The Seamy Side* (1881). Thereafter Mr. Besant devoted himself principally to writing novels, among which are *All Sorts and Conditions of Men* (1882), which is perhaps the best known, and practically started the social movement resulting in the building of the People's Palace in London; *Dorothy Forster* (1896); *The City of Refuge* (1896), and *The Orange Girl* (1889). Of his essays the most notable are, *The French Humorists*, *Rabelais*, and *lives of Coligny, Whittington, Edward Palmer, and Richard Jefferies* (1892), *South London* (1898), and *East London* (1900). Most of his novels display a keen perception of varied social conditions and a minute portrayal of character; some of them, particularly toward the close of his career, were written for the achievement of specific social reforms. Sir Walter founded in 1884 the Society of Authors, an organization designed to secure for authors, especially the young and inexperienced, fair treatment at the hands of publishers. He was knighted in 1895.

BESSONIES, Rt. Rev. Mgr. AUGUST, American Roman Catholic prelate, died at Indianapolis, February 22, 1901. He was born near Cahors, France, June 18, 1815, and studied for the ministry at Issy and St. Sulpice in Paris, graduating at the latter seminary in 1838. The next year he came to the United States as an assistant to Bishop Brute, of Vincennes, Ind. He was ordained priest in 1840 and sent out to labor among the Indians in Perry County, of that State, where he remained for ten years. He had charge of various parishes throughout the State, finally becoming established at Indianapolis in 1857. In 1881 he became vicar-general of his diocese and received the rank of monseigneur in 1884. Father Bessonies was a tireless temperance worker, was deeply interested in home missionary work, and was respected and esteemed by his associates, of whatever denomination.

BIBLE SOCIETY, AMERICAN, founded in 1816 for the distribution of bibles among the destitute and poor. At the close of the fiscal year 1900-01 the society had issued a total of 68,953,434 copies of the Scriptures. The total issues of the year amounted to 1,554,128 copies, nearly two-thirds of which were sent to foreign countries. More than half of the issues were manufactured at the Bible House, and of the remainder a large number were printed in Syria, Turkey, Siam, China, and Japan. The income of the year, from gifts, funds, etc., was \$391,383, nearly half of which has been authorized for the foreign work during the current year. Since its organization the society has received over \$30,000,000 from the public in America. Publications: The *Bible Society Record*, an illustrated monthly, and annually thousands of leaflets in various languages. Secretaries, Rev. John Fox, D.D., and Rev. William I. Haven, D.D., Bible House, New York City.

BICYCLING. See CYCLING.

BIEDERMANN, KARL, German politician and philosopher, died at Leipsic, March 5, 1901. He was born at Leipsic, September 25, 1812, and was educated at Heidelberg and the university of his native city, becoming professor of philosophy at the latter in 1838. For political reasons he was dismissed in 1845, and in 1848 began an active career in politics with his election to the National Assembly at Frankfort in that year. He was restored to his professorship in 1849, but was removed again in 1854 for editorial utterances in the *Deutscher Annalen*. In 1865 he was again reinstated and in 1874 was made an honorary professor. Throughout his political prominence, which was terminated by his resignation from the *Reichstag* in 1874 and from the Saxton Landtag in 1876, Professor Biedermann adhered to the most pronounced liberal ideas, which he expressed fearlessly in various political papers of which he was editor at different times. A prolific writer, he produced, among other works, *Die Deutsche Philosophie von Kant bis auf unsere Zeit* (1843); *Erinnerungen aus der Paulskirche* (1849); *Gedankens* (1892); *Fünfaig Jahre im Dienste des Nationalen Gedankens* (1892); *Vorlesungen über Socialismus und Socialpolitik* (1900); and the dramas *Heinrich IV.* (1861) and *Kaiser Otto III.* (1862).

BILLIARDS. The amateur championships of 1900-01 were carried through by the Amateur Athletic Union. Class B events (14-inch balk-line) were held December 5-17, 1900, at the Knickerbocker Athletic Club, New York City. A. G. Cutler, of Boston; J. A. Hendrick, of New York, and W. W. Kellogg, of Chicago, tied for first place with 4 out of 5 games each. By a previous agreement, made during the tournament, the championship was accorded to Cutler, as his grand average for the last two games was 7.19, against 5.37 for Kellogg and 5.17 for Hendrick, who took second and third prizes respectively. The average for the whole tournament for the three was respectively 7.13, 4.61, and 5.70; high runs, 48, 41, and 48. Cutler also made the best single average, 9.67, in his first game. The class A tournament (14-inch balk-line, anchor-nurse barred) was held at the same place during February 5-16, 1901. C. Fred. Conklin, by defeating all his opponents, won the honor of playing the holder of the championship, Wilson P. Foss, of Haverstraw, N. Y., in the finals. In a game requiring 46 innings Conklin led during the first half, but Foss won by 500 points to Conklin's 238, with an average of 10.40-46. Foss's highest run was 69. Conklin's highest run was 43, his average 5.32-46.

BIOLOGICAL STATIONS. See ZOOLOGICAL EXPEDITIONS AND STATIONS.

BIOLOGY. The progress of biology during 1901 was not unusually notable, but there were some forward steps taken which are worthy of mention. Most important of all is undoubtedly the work of Hugo de Vries, of Amsterdam, which throws much light upon questions of evolution. Although his work has been carried on with plants as the subject of investigation, his results are distinctly biological and not specially botanical. The report of his work is entitled *Die Mutationstheorie*, and is published at Leipsic. His results may be briefly summarized thus: He examined 50,000 plants of an evening primrose (*Oenothera lamarckiana*), descendants under natural conditions of a single plant. Of these, 49,200 were distinctly plants of the

same type, showing no tendency toward gradual change in any direction, but 800 showed such a marked change that they could not properly be called *Ce. lamarckiana*. They represent no less than 7 distinct types of structure, which De Vries calls species; of the one he calls *gigas*, there was 1 specimen, of *scintillans* 8, of *rubrinervis* 32, of *albida* 56, of *nanella* 158, of *lata* 221, and of *oblonga* 350. But more remarkable still is the fact that these species tend to reproduce their own kind; thus, the one plant of *gigas* gave rise to 450 plants, all but one of which were distinctly *gigas*. So far as De Vries's observations go, therefore, new species may appear suddenly by mutation, and not by the process of progressive variation. In other words, De Vries has actually seen the formation of new species in nature. The results of these observations are far-reaching, and if they are subsequently confirmed in other cases among plants and in the animal kingdom, they will prove to be the most important contribution to biological evolution that has appeared for many years. A new and fascinating field of research is thus opened up, and new life is infused into the old problem of the origin of species.

Another contribution to the theory of evolution is a paper by Mr. O. F. Cook, read before the Biological Society of Washington, and called *A Kinetic Theory of Evolution*. Mr. Cook points out that the differentiation of species is a phenomenon distinct from evolutionary progress, and that the relative importance of natural selection has differed greatly in the evolution of the various natural groups. He says further that "there is no essential connection between evolution and use. The vast majority of variations and specific differences are also obviously non-useful." "All hereditary characters are acquired, but not all acquired characters are hereditary." "Reactions to external conditions are not hereditary." "No direct nexus between environment and heredity has been demonstrated, and none is necessary under a kinetic theory." Mr. Cook's views are based primarily upon his observations in myriapods, but he has also studied termites, and various groups of plants. His conclusions are of special interest when compared with those of De Vries given above.

A paper of great importance by Prof. E. B. Wilson, of Columbia University, has appeared, recounting his observations upon the centrosomes of eggs which have developed by artificial parthenogenesis. According to him, there is little difference in the centrosomes of such eggs and those of normal ones, except that the cytasters are much better developed. Moreover, in normal fertilization "the activity of the egg-nucleus is modified through its union with an active individualized sperm-centrosome, the presence of which inhibits the formation of an egg-centrosome such as occurs in the magnesium eggs." Professor Loeb, of the University of Chicago, has continued his work upon the effect of chemicals upon the unfertilized eggs of marine animals, and, as was the case in 1900, his valuable and interesting results were seized upon by the sensational daily press, and distorted into the most grotesque statements of the discovery of the secret of perennial youth and the possibilities of unending life in our present bodies. No investigator of recent years has been so persistently exaggerated and misrepresented as has this distinguished physiologist. The most interesting of his results during 1901 were those on the effects of cyanide of potassium upon the eggs of the sea-urchin, which indicate that that poison acts under certain conditions as a preservative of life and a protection against what is called staleness in eggs. One other contribution to the general problems of biology may be mentioned; namely, A. G. Mayer's account of the *Variations of a Newly Arisen Race of Medusa*. Of 1,000 specimens of a hydromedusa, *Pseudoclytia pentacta*, occurring at the Dry Tortugas, 703 are normal pentactate individuals, while the others have 4, 3, 2, 6, 7, or 8 radial canals or lips, though 50 per cent. of them are radially symmetrical. The abnormal individuals appear to survive as well as normal ones, and mature their reproductive cells quite as commonly. They are not weeded out by natural selection, but they have not yet established new species. These observations are of great interest in connection with the recent discoveries of De Vries, to which reference has already been made. See ZOOLOGICAL EXPEDITIONS AND STATIONS and ZOOLOGICAL LITERATURE; also PHYSIOLOGY, CHEMICAL.

BIRD PROTECTION. See ORNITHOLOGY.

BIRTHRATE. See VITAL STATISTICS.

BISHOP, JOEL PRENTISS. American lawyer and legal writer, died at Cambridge, Mass., November 4, 1901. He was born at Volney, N. Y., in 1814, and was educated at Whitestone Seminary, the Oneida Institute, and the Stockbridge Academy. Admitted to the bar in 1844, he became active in the anti-slavery movement before the Civil War, and published in 1864 *Effect of Secession on Slavery*. Mr. Bishop was best known as the author of a long series of legal text-books, among which may be cited: *Commentaries on Criminal Procedure* (1867); *The First Book of the Law* (1868); *Law of Marriage and Divorce* (1869); *Doctrines of the Law of Contracts in Their Principal Outlines* (1878); a volume on *Civil Practice* (1882), and *Common Law and Codification* (1888).

BISMARCK ARCHIPELAGO, a group of islands in the Pacific ocean belonging to Germany, formerly called New Britain Archipelago, and renamed in 1884, when they came under German control, have an estimated area of 19,200 square miles and an estimated population of 188,000. There are only about 200 European inhabitants, of whom half are Germans. The principal islands are Neu Pommern, Neu Mecklenburg, Neu Lauenburg, New Hanover, Admiralty, Anchorite, Commerson, and Hermit. Missionary work is established by the Wesleyans and Catholics. The trade is controlled by the German New Guinea Company. The imports for 1899 amounted to a value of 1,060,00 marks; exports, 939,110 marks (the mark equals 23.8 cents). The export is chiefly copra, little agriculture existing, except plantations of the cocoa palm. There is steamship communication with Singapore. The capital is Matupi, where the New Guinea Company has a station.

BISMARCK-SCHÖNHAUSEN, Count WILHELM ALBRECHT OTTO, German soldier and official, the second son of Prince Bismarck, died at Varzin, Prussia, May 30, 1901. He was born at Frankfort-on-the-Main, August 1, 1852, and was educated at Bonn. After a short military service (1870-71), he entered the civil service in 1873 and became in 1879 secretary to the governor of Alsace-Lorraine. He was rapidly promoted, and in 1889 became chief president of the province of East Prussia. Count Bismarck was also a member of the *Reichstag* (1873-81) and of the Prussian Chamber (1882-85).

BISMUTOSE is an odorless, tasteless, white powder which becomes gray on exposure to light. It is insoluble in water. It is a combination of bismuth and albumin and contains 22 per cent. of bismuth. It is used with success in gastrointestinal diseases, and also locally in burns, intertrigo, and some forms of eczema.

BIZZOZERO, GIULIO, professor of pathological anatomy in the University of Turin, died April 8, 1901. He was born March 20, 1846, and was elected a fellow of the *Accademia dei Lincei* in 1883 and a senator in 1890. He was the founder of an Italian school of histology, and among his pupils was the celebrated Golzi. Professor Bizzozero's researches and discoveries dealt largely with the spinous cells of the epidermis, the functions of the medulla of the bones, the intestinal epithelium, and the morphological elements of the blood.

BLACK LEAD. See GRAPHITE.

BLODGETT, LORIN, American statistician and economist, died in Philadelphia, March 24, 1901. He was born near Jamestown, N. Y., May 25, 1823, and was educated at Jamestown Academy and Geneva (now Hobart) College. In 1851-52 he was assistant in charge of researches in climatology at the Smithsonian Institution, and for four years afterwards was engaged in Pacific railway survey work for the United States War Department. From 1863 to 1877 he was employed in the United States Treasury Department in the preparation of reports and statistics. He published *The Climatology of the United States*; *Commercial and Financial Resources of the United States*, and about 150 volumes of financial and industrial reports and statistics.

BOAT-RACING. See ROWING.

BOECKLIN, ARNOLD, Swiss painter, died at Fiesole, Italy, January 16, 1901. He was born at Basle, Switzerland, October 16, 1827, and studied art at Düsseldorf under Schirmer. After some years of further study in Paris and Rome, he went to Munich in 1858, and was called from that place to the new school of fine arts at Weimar in 1860, as teacher of landscape painting. Two years later he went to Rome, and later settled in Florence. In his landscape paintings he shows notable powers of conception, movement, and life, in subjects including the mythological as well as the purely modern landscape study. In 1868 M. Boecklin exhibited his first important work at the Paris Salon—"Petrarch in Solitude" and "Christ and the Magdalen," the latter being acquired by the museum at Basle. It was by the Basle Museum also that his picture, the "Centaur Struggle," was purchased. "The Sea Idyl," which won for M. Boecklin a medal from the Berlin Academy, is perhaps characteristic of his greatest work, and it was this picture that he sent to the Paris Exposition of 1900. "A Nymph and Fauns," bolder in conception and treatment than most of the preceding, raised a tempest of criticism, but it is admittedly the work of a man of large imagination. His pictures are to be found in nearly every large public and private collection in Germany, where his success was greatest.

BOERS. See TRANSVAAL.

BOKHARA. See TURKISTAN, RUSSIAN.

BOLIVIA, an interior republic of South America, lies between Brazil on the east and Peru and Chile on the west. The capital is La Paz.

Area and Population.—The eight departments comprising Bolivia have an estimated area of 567,430 square miles. A ninth department, the Littoral, embracing

29,910 square miles, was mortgaged to Chile after the war of 1879-80 and has never been redeemed. There is an unsettled boundary dispute with Peru. A protocol submitting to arbitration this question and others pending between the two countries was signed at La Paz on November 26, 1901. A joint Brazilian-Bolivian commission began its work of fixing the boundary between the two republics in March, 1901. The estimated number of inhabitants has been placed at over two and one-quarter million, including 250,000 uncivilized Indians, but according to an estimate of 1898 the entire population numbered only 1,310,000, comprising 79,050 whites, 299,500 mestizos, and 931,450 Indians, of whom 60,000 were classified as uncivilized. In 1901 the population of La Paz was reported at 46,000; Cochabamba, 21,896; Sucre, 20,907; Potosí, 20,000. The state religion and that prevailing among the people is Roman Catholicism. Primary instruction is free and nominally compulsory. In 1899 the reported number of primary schools was 692, the municipal schools numbering 366 and the private schools 322; the total number of pupils was 36,418. There are also schools for secondary, higher, professional, and industrial education.

Government.—The chief executive is a president, who is assisted by a cabinet of five members. The legislative power devolves upon a congress of two houses, the senate and the chamber of deputies. The president since October 26, 1899, has been General José Manuel Pando. The departments are administered by prefects. The regular army numbers about 2,500 and the national guard about 80,000.

Finance.—The monetary standard is silver and unit of value the boliviano, worth in United States money 45.1 cents on October 1, 1900, and 42.8 cents on October 1, 1901. The chief source of revenue is customs and the largest items of expenditure are for finance, war, and public works. Reports of actual receipts and expenditures are not available. The estimated revenue and expenditure for 1899 were 7,973,190 and 8,104,200 bolivianos respectively, and for 1900, 7,331,400 bolivianos and 7,930,188 bolivianos respectively. For the fiscal year 1902 the budget estimates were 10,117,700 bolivianos for revenue and 9,989,153 bolivianos for expenditure. The estimated import and export duties were 4,287,000 bolivianos and 2,091,390 bolivianos respectively, while the largest estimated expenditure was 2,748,943 bolivianos for war. The total debt, exclusive of the internal debt, in 1901, was reported at 13,857,852 bolivianos; the internal debt in 1900 stood at 3,934,250 bolivianos.

Industries and Commerce.—Agriculture and mining are the principal industries, but neither, in proportion to the capabilities of the country, is greatly developed. Aside from the minerals, the principal product is rubber; others of importance are cacao, cinchona, and coffee. Cereals and other foodstuffs are grown for domestic consumption. Of the numerous minerals that occur, the most important mined at present are silver, tin, and copper.

The revolution of 1899 was disastrous to economic conditions in Bolivia, but in 1901 these conditions showed a decided improvement. Numerous metallurgic enterprises were established and mineral industries, especially tin mining, were unusually successful. The depreciation of silver, however, has lessened the output of this metal. The rubber industry is most important in the Beni and Caupolicán districts; the export in 1899, valued at 13,560,000 bolivianos, comprised 3,151,000 kilogrammes, of which about 90 per cent. was shipped by way of the River Amazon and the remainder by the Paraguay. The rubber export in 1900 was valued at 10,403,959 bolivianos, and about the same in 1901. The principal ores exported in 1900 were: Silver, 13,691,268 pounds; tin, 8,579,539 pounds; copper, 1,025,030 pounds. The principal imports are provisions, hardware, alcoholic liquors, textiles, wearing apparel, and furniture. The values of the total imports and exports in bolivianos have been reported as follows: 1897, 12,457,242 and 21,990,455, respectively; 1898, 11,897,245 and 27,456,677; 1899, 12,839,962 and 27,365,747; 1900, 13,344,114 and 35,657,690. The exports for the last-named year were classified as follows: Mining products, 23,727,266 bolivianos; agricultural products (including rubber), 11,249,295; cattle, 297,482; manufactures, 227,041; miscellaneous, 156,606. In 1900 the leading countries from which imports were received were: Germany, 3,109,521 bolivianos; Great Britain, 2,265,307; Peru, 1,710,305; Argentina, 1,028,714; the United States, 815,555; France, 777,881.

Communications.—Inadequate transportation facilities continue to be one of the chief obstacles to industrial development in Bolivia. The roads are few and their condition is primitive. The principal routes are: Cochabamba-Sucre, 202 miles; La Paz-Oruro, 152 miles; Tarija-Tupiza, 143 miles; Oruro-Cochabamba, 127 miles; Potosí-Sucre, 90 miles; La Paz-Corocoro, 68 miles; Challapata-Sucre, 62 miles; Oruro-Lagunillas, 59 miles, and La Paz-Puerto Perez, 47 miles. The only railway is the narrow-gauge Oruro, which connects that town with Antofagasta (Chile), 575 miles distant. At Unguni, 379 miles from Antofagasta, there is an extension of 22 miles to the Huanchaca mines. An extension of the line is projected from Oruro to La Paz, the distance by rail being 37 miles greater than the length of the present cart road; the length of the entire line, accordingly, would be 764 miles.

Other proposed railways are: From Oruro to Cochabamba and the Beni River; from Colquechaca to the Oruro road; from La Paz to the River Desaguadero (under construction in 1901); from La Paz to Puerto Perez; from Potosí to Uyuni; and, among others, a continuation of the Argentine line from Jujuy. In 1901 the government accepted the proposal of a Belgian company for the construction of a port at Bahía Negra, and from there a railway to Santa Cruz, with branches to Sucre and Potosí; and for the canalization of certain rivers in eastern Bolivia and the establishment of colonies in lands for which the company had received concessions.

Events of 1901.—For certain financial and commercial considerations, including free transport through Antofagasta and the privilege of levying customs there, Chile in the fall of 1900 sought to secure from Bolivia a definite cession of the former Bolivian department, the Littoral, now mortgaged to Chile. Bolivia rejected the proposals. In the spring of 1901, however, Señor Medina, the Bolivian foreign minister, issued a circular letter to the Bolivian legations abroad, in which, while maintaining Bolivia's right to the department, he intimated that his government might accept the compensation—already mentioned in diplomatic correspondence—of about \$10,000,000 in lieu of a seaport.

In June, 1901, a British party, led by Mr. John W. Evans, started for Bolivia to continue there the work of exploration begun by Sir Martin Conway. The region to be explored comprises over 10,000 square miles, lying between the crest of the Andes and the Amazonian plain and the rivers Kaka and Beni and the River Pando (Iambopata). This region is not entirely unknown, but it has never been mapped or explored scientifically. It contains "the fertile valleys of Las Yungas and the famous gorges of the Tipuani, Mapiri, and Coroico, whence so large a part of the gold of the Incas was brought." Mr. Evans is a well-known geologist and traveler and has already done good work in western Brazil.

BORAX. The production of borax in the United States in 1900 was 24,235 short tons of crude and 1,602 tons of refined, having a total value of \$1,018,251. The total production for 1899 was 20,357 short tons, valued at \$1,139,882.

BORNEO, an East Indian island, has an estimated area of nearly 300,000 square miles and an estimated population of about 1,900,000. The northern part is under British protection; the remainder, comprising over two-thirds of the total area, is a possession of the Netherlands.

Dutch Borneo has an estimated area of 212,737 square miles and an estimated population, exclusive of several districts as yet unexplored, of about 1,181,000. Important settlements have been made in the coast districts, but the interior is not well known and is practically under the control of the natives.

British North Borneo, a protectorate having an estimated area of 31,106 square miles and an estimated population of 175,000, occupies the northeastern part of the island. The territory is administered by a governor (Edward W. Birch in 1901), who is assisted by a council and by several official residents. The revenue and expenditure for the fiscal year 1899 were 542,919 dollars (Mexican) and 410,290 dollars respectively; for 1900, 587,226 dollars and 398,152 dollars respectively. The revenue for the fiscal year 1901 was reported at about 700,000 dollars and the estimated revenue for 1902 at 820,000 dollars. The increase in revenue has been remarkable, the receipts for 1893 having amounted to only 289,000 dollars. There is no public debt. Various tropical and sub-tropical products are exported, the most important export being leaf tobacco, which amounted to 1,679,500 dollars in 1900. The total imports in 1900 were valued at 3,178,929 dollars, as against 2,456,999 dollars in 1899, and the total exports at 3,336,621 dollars, as against 3,439,560 in the preceding year. In the fall of 1901 there were under construction, from Brunei Bay into the interior and thence to Jesselton, in Gaya Bay, 110 miles of railway, of which about 90 miles were practically completed; and over 400 miles of telegraph were in operation.

Brunei, on the north coast, is a native state under British protection, having an estimated area of 3,000 square miles, though various other estimates are given, and an estimated population of 50,000. It is not unlikely that the latter figure is too large. The internal administration is in the hands of a native sultan, who is assisted by various chiefs. The chief export is sago, but there is little trade and the revenue is small.

Sarawak, a British protectorate on the north coast southwest of Brunei, has an estimated area of 50,000 square miles and an estimated population of 500,000. The state is administered by Rajah Sir Charles Anthony Brooke.

According to a British consular report the situation in Sarawak in 1900 was highly satisfactory, trade and agriculture being on the increase. To increase the production of rice so that Sarawak may be able to supply herself, an attempt was being made in 1901, with the support of the government, to form two colonies of Chinese agriculturists on the Rejang River. The revenue and expenditure, which in

1890 amounted to 413,000 dollars (Mexican) and 915,966 dollars respectively, reached in 1899 851,438 dollars and 843,230 dollars; in 1900, revenue 915,996 dollars, expenditure 901,172 dollars. The total trade of 1900 was nearly twice that of 1895, the imports amounting to 3,848, 679 dollars, as against 3,281,609 dollars in 1899, and the exports 5,217,036 dollars, as against 4,476,066 dollars in 1899. In 1900 the leading exports in order of importance were pepper, sago, flour, gutta-percha, gold, and rubber.

BORNIER, Vicomte HENRI DE, French poet and dramatist, died in Paris, January 29, 1901. He was born at Lunel, Hérault, December 25, 1825, was educated at Versailles, Montpellier, and Saint-Pons, and later studied law in Paris. In 1845 appeared his first drama, in verse, *Le Mariage de Luther*, which attracted the notice of the minister of public instruction and caused Bornier's appointment to the Bibliothèque de l'Arsenal, of which he became administrator in 1889. He twice obtained prizes from the Institute for poetry (1861 and 1863), and once for oratory (1864). He was three times laureate of the Institute and was decorated by the Legion of Honor in 1864 and promoted to officer (1891). M. Bornier, while he achieved success and fame as a poet, was more notable as a dramatist, although some of his productions were never presented. His most celebrated work is *La Fille de Roland* (1875), a drama which won an instant success from the fervid patriotism of its lines. Others that require mention are *Les Noces d'Attila* (1880); *l'Aretin* (1883), and *Mahomet* (1890). The last-named was suppressed in deference to the religious belief of the Mohammedan allies of France.

BOSNIA AND HERZEGOVINA, two provinces lying south of Hungary between Dalmatia and Servia, although nominally a part of the Ottoman empire, have been since the Treaty of Berlin (1878) occupied and administered by Austria-Hungary. The total area, including the sanjak of Novi-Bazar, which is occupied by an Austrian force, although under Turkish civil administration, is 23,571 square miles, and the population in 1895 was 1,568,092, of whom 673,246 belonged to the Orthodox Greek Church, 548,632 were Mohammedans, and 334,142 were Roman Catholics. The administration of the provinces is under the control of the Austro-Hungarian minister of finance, assisted by a local provincial government, having its seat at Sarajevo, a city of 38,083 inhabitants. The expenditure for the administration of the provinces in 1901 was estimated at 42,591,451 kronen, which did not include the cost of maintenance of the army of occupation, numbering 20,110 men. The revenue for the same year was estimated at 42,789,881 kronen. The krone is worth 40.6 cents.

About 88 per cent. of the inhabitants live by means of agriculture, which is still in a low state of development. The chief products are tobacco, which is a government monopoly; dried fruits, of which 20,000 tons, valued at £200,000 were exported in 1899; grain, goat and sheep skins, and minerals. The greater part of the skins exported went to Great Britain and the United States. The mines, mainly controlled by the government, produced in 1899 coal (303,425 tons), iron ore (67,085 tons), copper, and manganese. The provinces are included in the Austro-Hungarian customs territory, and there are no separate trade statistics. There are 555 miles of railway. Education is free but not compulsory. There are four gymnasia, nine commercial, and 235 elementary schools, and two training schools for teachers. The Greek and Roman Catholics each support theological seminaries, and the Mohammedans 854 lower schools and a college.

In May, 1901, the government provided for the construction of a railroad from Sarajevo, the capital, to the sanjak of Urak on one side, and the Servian frontier at Vardiste, on the other, the total cost to be about 75,000,000 kronen. In May a narrow-gauge railway 126 miles in length was opened from Gabela, in Herzegovina, to Castelnova, on the Bocche di Cattaro, with branches to Trebinje, on the Montenegrin frontier, and to Gravosa, a port in Dalmatia.

BOSTON PUBLIC LIBRARY, in Boston, Mass., consists of a central library on Copley Square, housed in one of the most beautiful buildings of its kind in the United States, and of 87 agencies, fifteen of which were established during 1901. These agencies include 11 branch libraries, 5 reading rooms, and numerous deposit and delivery stations in public schools, fire-engine houses, and reformatory institutions. The number of volumes in the library is 281,377, an increase during 1901 of more than 37,000, 7,000 of which were accessions by gifts representing more than 2,000 donors. The Boston Library has the largest circulation of books of any library in the United States, the total circulation for the year being 1,324,728, an increase of 73,187 over 1900. The most important additions in 1901 were made to the manuscript department. The Chamberlain collection of more than 30,000 pieces was received by bequest, and in addition several smaller collections relating to the early history of Boston and to the abolition movement. As a further means for interesting the public in the work of the library, the trustees established a course of lectures, inaugurated by Colonel T. W. Higginson. During the year the John

Eliot decorations were received by the library and made public. These decorations were provided for by gifts made in 1891. The remainder of the Edwin A. Abbey (*q.v.*) series on the "Search for the Holy Grail" have also been placed on public exhibition. These series of decorations are numbered among the most noted of American contributions to art.

BOTANICAL SOCIETY OF AMERICA, a national scientific society organized 1893 as an outgrowth of the Botanical Club of the American Association for the Advancement of Science. Its membership includes many of the best-known botanists of the country. Secretary, Professor George F. Atkinson, Cornell University, Ithaca, N. Y.

BOUTELLE, CHARLES ADDISON, congressman, died at Waverly, Mass., May 21, 1901. He was born at Damariscotta, Me., February 9, 1839, and was educated in the public schools and at the Yarmouth (Me.) Academy. At 15 he adopted his father's profession of shipmaster, following this until 1862, when he entered the United States navy. During his four years of service in the Civil War he took part in various engagements as an officer in the North and South Atlantic and West Gulf squadrons. He acquired control of the Bangor (Me.) *Whig and Courier* in 1874, became active in Republican State and national politics, and was elected to Congress in 1882. There he served continuously from that time until his death, being notably active in naval legislation, and largely responsible for the upbuilding of the iron-clad, modern American navy.

BOWDOIN COLLEGE, Brunswick, Me., founded 1794. In 1900-01 the college had a faculty of 35 and an attendance of 434, of which number 254 were in the academic department, and 91 in the medical department. The library contains 70,159 volumes, of which 2,913 were additions during the year. The most important changes during the year were the change from a three to a four years' course in the medical school; the introduction of a course in Spanish throughout the senior year; the recommendation by the president that the degrees of B.S. and B.L. be dropped, and that the one degree, B.A., be given for the four years' collegiate course, with or without Greek. Professor A. L. P. Dennis, Ph.D., of Harvard, takes the chair of history and political science, succeeding Professor William McDonald, who accepted a call to Brown University. Gifts amounting to \$30,000 were received during the year.

BOWLING. Two new records were made in 1901: the best average by teams of five in two consecutive games, by the Palace team of Columbus, O., 1,029; and the best similar average in three consecutive matches, by the Tosseti team, of Chicago, 1,006. The first American Bowling Congress championships were held in Chicago. The individual championship was won by Frank Brill, of Chicago, with 648 pins for 3 games; the two-men team championship by I. Voorhees and C. K. Starr, of New York, with 1,203 pins for 3 games; the five-men team championship by the Stanford team, of Chicago, with a total of 2,720 pins for 3 games.

BOXING. The contests for boxing (except prize-fights) are mainly those conducted under the auspices of the Amateur Athletic Union. In 1901 the following were the winners in the various weights: 105 pounds, I. Brown, Pittsburg; 115, George Young; 125, John L. Scholes, Don Rowing Club, of Toronto; 135, J. F. Mumford, New West Side Athletic Club, New York; 145, J. J. Dukelow, Rochester Athletic Club; 158 and also heavyweight, Wm. Rodenback, New West Side Athletic Club.

BOYLE, Sir COURTENAY, K.C.B., British financier, died in London, May 19, 1901. He was born in Jamaica, W. I., in 1845, and was educated at the old London Charterhouse School and at Christ Church, Oxford. He served as official private secretary to Lord Spencer, viceroy of Ireland, from 1868 to 1873, and in 1874 was appointed local government inspector for the eastern counties of Ireland, serving during the Phoenix Park murders and the Crimes Act of 1882. In 1886 Mr. Boyle was transferred to the Board of Trade in London, becoming permanent secretary in 1893. It was in the successful handling of transportation problems and the management of fisheries, harbors, lighthouses, etc., that his work was most valuable. At school he formed a close friendship with Thackeray during a visit of the latter, and maintained it until Thackeray's death.

BOYSSET, CHARLES, French legislator, died in Paris, May 23, 1901. He was born at Chalons-sur-Saône, April 29, 1817, and was educated for the law. First elected to the Chamber in 1871, M. Boysset served there continuously for almost thirty years, becoming dean of that body. Throughout his legislative career he was a member of various committees to prepare the annual budgets, in all of which he strove persistently to reduce the appropriations made to religious and theological organizations.

BRADBURY, JAMES WARE, ex-senator from Maine, died at Augusta, in his native State, January 6, 1901. He was born in York County, July 10, 1802, and grad-

uated at Bowdoin College in 1825. After teaching for a time he studied law and was admitted to the bar in 1831. He was in the Senate from 1847 to 1853 as a Democrat, during the excitement attendant upon the war with Mexico, and vigorously supported the policy of President Polk concerning the conflict. Senator Bradbury served on the judiciary and claims committees and a select committee on the French spoliation claims. A result of his work was the preparation by him of an amendment to a pending bill, which provided for the establishment of a permanent court of claims (instituted in 1855) to adjust claims of citizens against the United States. At the expiration of his term Senator Bradbury declined a renomination and retired to the practice of law.

BRAZIL, the largest republic in the world except the United States, occupies the central and eastern part of South America. The capital is Rio de Janeiro.

Area, Population, etc.—The total area of the twenty states and federal district comprising Brazil has been estimated at about 3,209,000 square miles, and later at 3,218,000 square miles. The population, which, according to the census of 1890 (the last taken), was 14,333,915, has more recently been estimated at about 17,500,000. The population of Rio de Janeiro (522,651 in 1890) was placed at 780,000 in 1899; it is not unlikely, however, that this estimate was too high. The number of foreigners in Brazil (1901) is reported at about 2,700,000. Of these 1,300,000 are Italians, 800,000 Portuguese, 300,000 Germans, 100,000 Spaniards, 80,000 Poles, 10,000 French, and 5,000 English. It is said that only one or two per cent. of these preserve their original nationality.

The prevailing religion is Roman Catholicism. Recent educational statistics are not available, but it is certain that general education, which is nowhere compulsory, is in a backward condition.

Government.—The chief executive is a president (Senhor M. F. de Campos Salles for the four-year term ending November, 1902), who is assisted by a cabinet not responsible to the Congress. The latter is the national legislative body and consists of a senate and a chamber of deputies, which convene annually on the 3d of May for four months. The several states enjoy local self-government.

Army and Navy.—In 1900 the regular army consisted of about 2,600 officers and 14,600 men. The navy comprises 2 third-class battleships, 2 second-class cruisers, 2 third-class cruisers, 3 torpedo cruisers, 8 first class torpedo boats, and a number of smaller or older craft.

Finances and Economic Conditions.—The monetary standard is gold and the unit of value the milreis, which is worth 54.6 cents in United States money. For some time previous to 1901 the paper milreis (par value 54.6 cents) had depreciated, falling to about 12 cents, but in that year, on account of the contraction of the currency, it rose to about 23 cents. The chief source of revenue is duties on imports; the principal items of expenditure are interest on the public debt and the maintenance of the departments of agriculture, war, and marine. The estimated revenue for 1900 was reported at 27,000,000 milreis gold and 281,000,000 currency; for 1901 the revenue was estimated at 58,869,741 milreis gold and 286,082,200 currency, and the expenditure 37,509,985 milreis gold and 244,514,194 milreis currency. In his report published in September, 1901, the minister of finance stated that the financial condition of the government had considerably improved.

A British consular report published in the summer of 1901 described the economic condition of the country as unsatisfactory. The measures taken by the government for the improvement of the public finance have laid heavy taxation on the people, while state and municipal taxation are equally burdensome. This increased taxation has come at a time of great local depreciation in the value of coffee, the chief national product. There were large stocks of coffee on hand in 1901, while the harvest for the year was abundant; the world's production for the year has been stated at 16½ million bags and the consumption at only 14½ millions. From these facts, together with a consideration of Brazil's fluctuating currency and the troublesome problems of wages and labor, the British consul concluded that a successful reconstruction of economic conditions could hardly be expected in the immediate future.

What appeared to be a somewhat more favorable view was held by the United States minister at Rio de Janeiro, who, under date of July 3, 1901, reported that specie payments on the foreign debt had been resumed after a lapse of three years; that Brazilian securities had risen from 45 per cent. to 75 per cent. of par; that the paper currency had been contracted from 788,000 contos (a conto is 1,000 milreis) to 689,000 contos; that the value of the milreis in United States money had risen from 11.25 cents to 23.03 cents; that 21,000 contos of treasury bills outstanding July 1, 1898, had been redeemed; that internal gold bonds amounting to \$12,166,250 had been paid off; and that important measures of retrenchment had been introduced in the administration. It must be noted, however, that the net gold debt had been increased by over \$24,330,000. The minister called attention

to the fact that importations had seriously declined and that internal taxes had been increased, and he pointed out that "the rise of the sterling value of the milreis had lowered the currency price of exports, and the contraction of the circulation had apparently had an influence in limiting commercial operations." But he added: "This period of stringency is already beginning to moderate, and the process of the adjustment of prices and credits to sounder currency values is proceeding normally. . . . It is clear that a continuation of the policy of the present administration will result in Brazil meeting promptly foreign obligations."

The debt of Brazil in the early part of 1901 is stated as follows: On January 1, 1901, the external funded debt amounted to £44,396,976 (\$216,057,884). This debt was renewed on July 1, 1901, and for its service £2,034,257 (\$9,899,712) were remitted to London. The internal funded floating debt (payable in gold), on March 31, 1901, was reported at 27,259,000 milreis (\$14,883,414); the amount payable in paper was 543,826,637 milreis (\$81,573,996, valuing the paper milreis at 15 cents). The floating debt, at the rate of 15 cents per paper milreis, amounted to \$24,836,603. The paper money in circulation amounted to 689,000,000 milreis. The total currency indebtedness of the republic was 1,398,403,972 milreis, or \$209,760,595, at 15 cents per paper milreis. The total debt accordingly (foreign and internal) was \$440,701,893. The total given above for the internal gold debt includes the $4\frac{1}{2}$ per cent. loan of 1879, amounting to 20,549,000 milreis, which is usually included in the foreign debt.

Industries and Commerce.—The principal industry is agriculture and the leading crop coffee. Other important products are rubber, sugar, tobacco, maize, yerba maté, cotton, cacao, beans, and nuts. Various minerals occur, including gold and diamonds. The estimated coffee crop of the year 1900-01 was 12,000,000 bags. During the year ending May 31, 1901, the coffee receipts at Santos and Rio de Janeiro, the two great coffee-shipping ports, aggregated 10,361,000 bags. Rubber is produced chiefly in the Amazon valley; the production from that region in 1900 was reported at 25,807 metric tons; the export in the same year amounted to 27,686 tons, of which 14,314 tons were sent to the United States and 12,435 to Europe. The annual sugar production is estimated at 250,000 tons; the sugar export in 1900 was about 31,000 tons.

The principal imports include cotton and woollen goods, iron and machinery, provisions and alcoholic liquors, cattle, and coal. Among the leading exports are coffee, rubber, cotton, tobacco, sugar, and cacao. Recent statistics for the total commerce are not available. In 1897 the imports and exports, exclusive of specie, were valued in currency at 671,603,280 milreis and 831,806,918 milreis respectively. Trade is carried on chiefly with Great Britain, the United States, Germany, and France (see the paragraph Finance and Economic Conditions). In 1900 there were 9,172 miles of railway in operation, the approximate cost of which was \$571,000,000.

The unfavorable economic conditions of Brazil have been attended by political troubles. In the latter part of March, 1901, an alleged plot to assassinate President Campos Salles and reestablish a monarchical government was discovered in Rio de Janeiro. Admiral Custodio de Mello and others were arrested for complicity in the plot. The opposition to the administration asserted that the whole affair was "a pretext for the prosecution of the president's personal enemies." In the summer of 1901 various high officials, including the minister of the interior, resigned and the political outlook was unfavorable. Popular discontent was caused by the depreciated value of coffee, due to overproduction, and the enhanced value of the paper currency, which increased the cost of labor and made taxation more burdensome.

It was reported about May 1 that Indians had attacked certain settlements in Maranhao and killed some 200 Christians, and in September an uprising occurred in Matto Grosso.

In the fall of 1901 it was announced that a German syndicate with a capital of 21,000,000 marks (\$4,760,000) had been organized for the purpose of founding German colonies in the States of Rio Grande, Sao Paulo, Santa Catharina, Minas Geraes, Goyaz, and Paraná; an Italian syndicate with a capital of 50,000,000 lire (\$9,650,000) proposed to establish Italian colonies in Brazil.

A treaty submitting the boundary dispute between Brazil and British Guiana to the arbitration of the king of Italy was signed in London, November 6, 1901, by the Brazilian minister, Senhor Joachim Nabuco, and Lord Lansdowne.

On September 20, 1901, the Republican convention held at Rio de Janeiro nominated for president of the republic Dr. Rodrigues Alves, governor of Sao Paulo and formerly minister of justice, and for vice-president Dr. Silviano Brandao, governor of Minas Geraes. These nominations implied the wish of the party to continue the policy of the outgoing administration. The presidential election was to take place in March, 1902.

BRETSCHNEIDER, DR. E., Russian sinologue, died in St. Petersburg, May 12, 1901, at an advanced age. For many years Dr. Bretschneider was physician to the Russian legation at Peking, and took advantage of the opportunity to investigate Chinese archaeology, history, language, and geography. He published volumes on: *The Study and Value of Chinese Botanical Works* (Fuchau, 1870); *Knowledge Possessed by the Ancient Chinese of the Arabs and Arabian Colonies and Other Western Countries Mentioned in Chinese Books* (London, 1871); *Notes on Chinese Mediæval Travellers to the West* (Shanghai, 1875); and *Mediæval Researches from Eastern Asiatic Sources* (London, 1883). To students of Oriental history Dr. Bretschneider's work has been of great value.

BREWER, MARK SPENCER, United States civil-service commissioner, died at Washington, March 18, 1901. He was born at Addison, Mich., October 22, 1837, and spent the first twenty years of his life on his father's farm. After an academic education he began the study of law in 1861, and three years later was admitted to the bar at Pontiac, in his native State. He was city attorney there, 1866-70, and was in the State senate, 1872-74. In 1877 he was sent to Congress as a Republican, and remained until 1881, when he became consul-general at Berlin. He was recalled by President Cleveland in 1885, and once more served in Congress, 1887-91, when he declined a renomination. In 1898 he was appointed a civil-service commissioner.

BRIDGE-BUILDING. The record of notable bridges completed and in process of construction during 1901 includes much that is of interest. In the United States the three great bridges across the East River, between Manhattan and Brooklyn, in New York City, stand foremost in size and importance. Of these three bridges, that known as the New East River Bridge is now well on toward completion, work having been begun on the suspension cables during the closing months of the year. The clear span of this bridge is 1,600 feet, and its total length is 7,200 feet. The Third Bridge is also a suspension bridge, and contracts for the Brooklyn tower foundations were let during the year. The principal dimensions of this structure are as follows: Total length between terminals, 9,335 feet; length of centre span, 1,465 feet; length of shore spans, each, 850 feet; width over all, 120 feet; height of towers to cable centre, 325 feet; clear height above water at centre, 135 feet; number of cables, 4; diameter of cables (approximate), 19 inches; capacity, 4 trolley tracks, 2 elevated railway tracks, 1 36-foot roadway, and 2 sidewalks. The Fourth Bridge, which crosses over Blackwell's Island, will be a cantilever structure, and the foundations and masonry work were contracted for during 1901. The following are the principal dimensions of this bridge: Length of Manhattan approach, 1,102½ feet; length of Manhattan anchor span, 469½ feet; length of west channel span, 1,131 feet; length of Blackwell's Island span, 630 feet; length of east channel span, 984 feet; length of Queens anchor span, 459 feet; length of Queens approach, 3,455 feet; total length, 8,231 feet; capacity, 2 sidewalks, 2 roadways, 4 trolley tracks, and 2 elevated railway tracks.

The only existing cantilever bridge having a span greater than the west channel span of the Fourth Bridge across the East River is the Forth Bridge across the Firth of Clyde in Scotland, which has two spans of 1,720 feet each. There is, however, a cantilever bridge under construction across the St. Lawrence River at Quebec, Canada, which will have a main span 1,800 feet long. During 1901 work was actively in progress on the substructure for this Canadian bridge, and the manufacture of the steelwork was begun. It is of interest to note in passing that the steelwork for this great structure will be built and erected by a United States concern. Another large Canadian bridge, which was put into operation in 1901, was the Royal Alexandra (Interprovincial) Bridge at Ottawa, Canada. This bridge has a main cantilever span of 1,049 feet 9 inches.

No new developments in connection with the long-projected bridges across the Hudson River at New York City were recorded during the year. Nothing further was heard during 1901 of the proposed long-span bridges across the Detroit River near Detroit, Mich., and across the Mississippi River at New Orleans, La. On July 24, 1901, the former Brooklyn Bridge, completed across the East River at New York City in 1884, suffered an accident which caused considerable popular excitement and apprehension, and which was widely discussed by engineers in an endeavor to determine its cause and significance. The accident was the breaking of nine of the steel suspender rods which suspend the north stiffening truss from the north cable. An investigation showed that two of these rods had been broken for some time, and that some of the others were partly fractured previous to the final break which called attention to the conditions. On September 14, 1901, two expert engineers who had been delegated by the district attorney to investigate the accident presented a report which criticised the original design of the bridge, arraigned the engineers in charge of its maintenance for carelessness, and suggested

NEW EAST RIVER (WILLIAMSBURG) BRIDGE.

improvements in order to do away with further danger. Exceptions to this report were taken by the engineers who designed the bridge and also by the engineers in charge of its maintenance, and many columns of the engineering papers were occupied with the technical discussions which followed. A rather notable step was taken by the city of Chicago during 1901, in its formal adoption of a plan to replace gradually the various railway and highway swing bridges across the Chicago River with bridges of the bascule type. Altogether there are about 50 swing bridges across this stream, and of these it was decided to replace 12 at once. Work was begun on several of these new structures during 1901.

Passing to the more remote possessions of the United States, we find that the events of the year record the construction of two steel bridges in Alaska and of a number of concrete-steel arch railway bridges in Porto Rico. The most notable of the two Alaskan bridges was a cantilever structure of 240 feet span on the White Pass and Yukon Railway, about 18 miles from Skagway. The second of the two Alaskan bridges was a 154-foot truss span across the Klondike River near Dawson City. The concrete-steel arch bridges erected in Porto Rico were excellent examples of this type of construction, but hardly call for particular mention.

It may be noted that concrete-steel types of bridge construction continued to receive favor among American engineers, and numerous arches of this construction were built for railway and highway purposes throughout the United States. Perhaps the most notable of these structures was the so-called Y Bridge at Zanesville, O., which was well on toward completion at the end of 1901. This bridge has eight concrete-steel arch spans—three of 88 feet, one of 99 feet, and four of 122 feet. A stone-arch bridge notable for its length was nearly completed during 1901 across the Susquehanna River at Rockville, Pa., on the Pennsylvania Railroad, and plans were prepared and contracts let for two similar structures at Trenton, N. J., and New Brunswick, N. J. The Rockville Bridge consists of 48 arches of 70-foot span, making, with the piers, a structure 3,820 feet long. The proposed Trenton Bridge had 18 arches of 60-foot span, and the New Brunswick Bridge 21 arches, one 72 feet, eight 51 feet, one 56 feet, and eleven 66 feet.

With regard to the bridge-building of foreign countries, space permits merely a mention of the more important new bridges and new bridge projects. In connection with the concession held by Germany for a railway to Bagdad and the Persian Gulf, a bridge across the Bosphorus at a point where it is only 1,700 feet wide was proposed early in January, 1901. A steel suspension bridge was proposed, high enough to permit the passage of vessels beneath. Its cost was estimated at \$15,000,000. In July, 1901, formal tenders were submitted to engineers for the design and construction of a bridge across Sydney Harbor, between Sydney and North Sydney, New South Wales. These tenders called for a design to have a clear headway of 170 feet, for 600 feet at the centre of the main span, and of not less than 150 feet for the remainder of the main span, which must be of such a length that the clear waterway between piers should be at least 1,200 feet. On July 10, 1901, the bridge over the Amou-Daria River in Russian Central Asia was opened for traffic. This is the largest bridge in the Russian empire, and replaces a timber trestle $1\frac{1}{2}$ miles long by which the Mid-Asiatic Railway previously crossed the river named. It consists of 25 spans of 210 feet each and two end spans of 35 feet each, carried on masonry piers. The total opening is 5,250 feet, or 30 feet less than a mile. An interesting feature of this structure is that the steelwork was constructed mostly by Russian firms. Early in December, 1901, engineers were invited to submit competitive designs for a bridge across the River Neva in St. Petersburg, Russia. This structure is to be 847 feet long and 91 feet wide, with a 98-foot draw-span. In December, 1901, a company made application to the Canadian government for a charter to build a railway and highway bridge across the Strait of Canso, Nova Scotia, with a main span of at least 1,000 feet. No very notable metal bridges were built or projected in Continental Europe during 1901, but several truly remarkable works in stone-work bridge construction belong to the records of the year. First of these is the enormous structure building at Luxemburg. This bridge crosses the valley of the Petrusse and will have an arch span of 84 meters, or 275½ feet, which is 55½ feet greater than any other arch span in the world. Besides being remarkable for its great size, this bridge is notable for its construction. It will consist of two parallel arches spaced 19.68 feet apart in the clear, with the intervening space spanned by slabs of concrete-steel material. The bridge, when completed, will cost about \$280,000. Two other European arch bridges, one of 210 feet span and the other of 187 feet span, are located on the Neustadt and Donaueschingen Railway in Germany. The longer bridge crosses the Gutach River and the shorter crosses the Schwaendeholz Brook. In Spain plans were made public for a three-hinged concrete-steel arch of 165 feet span over the River Nalon.

BRIGHT, WILLIAM, D.D., Anglican divine and ecclesiastical historian, died at Christ Church, Oxford, March 6, 1901. He was born at Doncaster December 14,

1824, and graduated with first classical honors at University College, Oxford, in 1846. After remaining there as fellow he took orders, being ordained priest in 1850, and in the following year became tutor in theology at Trinity College, Glenalmond. There he remained until 1859, when he returned to Oxford as tutor and in 1868 was appointed regius professor of ecclesiastical history and canon of Christ Church, the incumbency of which offices he retained until his death. Canon Bright was an active writer, and in addition to his historical productions which are authoritative, wrote many poems, hymns, and theological treatises. Among his works are, *A History of the Church, from the Edict of Milan to the Council of Chalcedon* (1860); *Hymns and other Verses* (1866); *Waymarks in Church History* (1894); and *Some Aspects of Primitive Church Life* (1898); and editions of Eusebius' *Ecclesiastical History* (1872); Athanasius' *Orations Against the Arians* (1873); and Socrates' *Ecclesiastical History* (1878).

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, founded 1831, held its annual meeting at Glasgow, September 11, 1901, and following days. President Arthur W. Rücker, in his opening address, discussed in detail the atomic theory and the doubts recently expressed as to its value. He contended that the atomic theory unifies so many facts and simplifies so much that is complicated that we have a right to accept it until an equally intelligible rival hypothesis is produced. In section A, Mathematics and Physics, President P. A. McMahon, D.Sc., F.R.S., reviewed the progress made in mathematical science during the past century and pointed out the true function of the specialist. Lord Kelvin also lectured on the actual amount of gravitational matter in any large volume of interstellar space. The position of British chemistry at the beginning of the twentieth century was the subject of Professor Percy Frankland's address in section B, Chemistry. In section C, Geology, the recent advances in Scottish geology furnished the inspiration for a very interesting paper by President J. Horne, while Professor Cossar Ewart discussed in section D, Zoology, the experimental study of variation. In section E, Geography, Dr. H. R. Mill delivered an address in which he outlined the sphere of the science, dwelling on its theoretical and practical importance. In connection with the subject of acquiring material for a complete geographical description of the British Isles, Dr. Mill stated that a bathymetrical survey of the fresh-water lakes in the United Kingdom was about to be undertaken by private enterprise. In section F, Economic Science and Statistics, Sir Robert Giffen, the president, discussed the subject of *The Importance of General Statistical Ideas*, and a paper which aroused considerable interest was one read by Mr. Edward Canan on *The Decline of Natality in Great Britain*. The main points emphasized were, that the decline of natality was not due to the lack of marriages, but to the falling off in the size of families and the tendency to sterility, which was becoming so marked a feature of married life not alone in Great Britain but in other countries. France, it was claimed, was the grand modern example of the "sterile family," but it was claimed by one of the participants in the discussion that the United States and Canada were a close second to France in the latter part of the nineteenth century. In the course of the debate comparative reference was made to Greece and Rome, as well as to some of the modern nations, and the view was expressed, but dissented from by the president, that "the decay of religious belief appeared as the one common antecedent to the decline of the birth-rate." In section G, Mechanical Science, Colonel R. E. Compton dealt with the subject of modern development of passenger and goods traffic, and in section H, Anthropology, Professor D. J. Cunningham, of Trinity College, Dublin, discoursed on the human brain and its part in the evolution of man. Professor McKendrick, of Glasgow University, in section I, Physiology, discussed some of the problems of molecular physiology, and in section K, Botany, Professor Bayley Balfour devoted his attention to the technical subject of *Angiosperms*. A new and important section, section L, Education, was for the first time represented at the meeting of the Association, and many of the leading educators of the country were in attendance. The address of the president, Sir John Gorst, dealt with the important question of the proper function of national authority in the education of the people. A joint discussion was later held by the Education Department with the Mathematical Department of section A, on the teaching of mathematics. Economics and commercial education and educational methods generally furnished inspiration for part of the discussion. There were many interesting papers read, apart from those representing the special departments, and embracing a variety of purely technical matter. In the section of Economic Science (F) papers were read and discussed relating to shipping subsidies, British export trade, progressive taxation, land tenure and British agriculture. The "housing" question was also treated by Professor W. Smart. A popular lecture was delivered by Professor W. Ramsay on the inert constituents of the atmosphere; a paper read by Major Ross, in connection with section D, Zoology, on *The Story of Malaria*, with lantern illustrations, and an important contribution to the work of section L, Education, was made by the

Bishop of Hereford in a paper on the influences of universities and examining bodies upon the curriculum of secondary schools. At the general committee meeting, in accordance with custom, resolutions were passed in relation to the next meeting, which is to be held in Belfast in 1902 under the presidency of Professor Dewar.

BRITISH CENTRAL AFRICA, a name applied to a large territory in southern central Africa, which, with the exception of the British Central Africa Protectorate, is administered by the British South Africa Company, under the name of Northern Rhodesia. See the following article, RHODESIA, and CAPE-TO-CAIRO RAILWAY.

BRITISH CENTRAL AFRICA PROTECTORATE, formerly known as Nyassaland, lies between Lake Nyassa and Northern Rhodesia. Its estimated area is 42,217 square miles and its estimated population in 1900 about 900,000, of whom only some 400 were Europeans. The largest town is Blantyre, with about 6,000 inhabitants. The protectorate is administered by a commissioner, Mr. Alfred Sharpe in 1901, whose headquarters are at Zomba.

The chief interests are planting, mainly coffee, and the transportation of goods to and beyond the protectorate. Labor is scarce and the coffee industry has suffered, since many laborers engaged therein have turned to the work of transportation. The value of the imports in the year ending March 31, 1901, was £146,043 as against £176,034 in the preceding year, while the exports in the two years amounted to £38,723 and £79,349 respectively, the decline being almost wholly in the coffee exports. Goods in transit, however, increased from £31,337 to £51,333. A railway is projected to connect Blantyre with Chiromo.

BRITISH COLUMBIA, a province of the Dominion of Canada, with an area of 383,300 square miles. Its population, according to the census of 1901, was 178,657, as against 98,173 in 1891, showing an increase of over 81 per cent., the largest increase in the dominion, with the exception of the Northwest Territories. The capital is Victoria, with a population of 20,821 in 1901, against 3,980 in 1891. The province has a free undenominational school system supported entirely by the government. In 1900 it had 246 common schools, with 7,165 pupils enrolled; 48 graded schools, with an enrolment of 13,813; and four high schools, with 553 pupils. The expenditure on education for 1900 was \$307,479, against \$336,016 in the preceding year.

Government and Finances.—British Columbia is administered by a lieutenant-governor and a responsible ministry. It has only one chamber (legislative assembly) of 38 members elected by manhood suffrage. In the Dominion Senate and House of Commons the province is represented by three and six members respectively. The finances of the province have improved, although the revenue still falls short of the expenditures. For the fiscal year 1900 the receipts amounted to \$1,544,108, including \$242,689 received from the Dominion government, \$104,304 general mining receipts, \$133,766 receipts for "free miners' certificates, and \$188,214 tax on real estate. The expenditures for the same year amounted to \$1,831,205 as compared with \$2,156,474 for the preceding year. The chief items of expenditure for 1900 were interest on the public debt, \$243,637; civil government, \$172,577; public work, \$323,329; and sinking funds, \$106,207. The gross debt increased during 1900 from \$8,243,083 to \$8,866,868, and the assets from \$2,762,835 to \$3,098,304.

Industries.—Mining, the principal industry of the province, showed considerable progress during 1900. The total value of the mineral output for that fiscal year was \$16,344,751 against \$12,393,131 for 1899 and \$10,906,861 for 1898. The chief minerals produced in 1900 were gold, \$4,732,105; silver, \$2,309,200; lead, \$2,691,887; copper, \$1,615,289; coal, \$4,318,785; and coke, \$425,745. Next to the mines, the fisheries are the largest source of the wealth of the province. British Columbia ranks second among the provinces of the Dominion in fisheries' production, Nova Scotia occupying the first place. The total catch for 1899 (the latest year for which official statistics are available) was valued at \$5,214,074, showing a large increase over the preceding year, when it amounted to \$3,713,101, but still falling short of the catch of 1897, valued at \$6,138,865. The salmon pack for 1899 amounted to \$4,007,396 against \$2,661,830 for the preceding year. The value of the product of fisheries exported from British Columbia in 1900 was \$3,443,037, as compared with \$2,740,100 in 1899. Preliminary figures give the value of the catch for 1900 as \$6,787,756.

Commerce, Banks, etc.—The trade of British Columbia for 1900 was the largest in the history of the province. The exports amounted to \$17,843,906, against \$14,748,025 in 1899, and were composed as follows: products of mines, \$11,946,815; products of fisheries, \$3,442,997; forest products, \$710,883; manufactures, \$445,884; and animals and their produce, \$484,027. The imports amounted to \$11,255,679 against \$8,687,221 in 1899. Of the imports, goods to the value of \$5,753,424 were produce of the United States. There were in the province in 1900, 47 chartered banks and branches and 44 post office savings banks, with 3,676 depositors and deposits amounting to \$1,068,020. The only government savings bank of the province had in the same year 3,417 depositors and deposits amounting to \$1,158,900. The clearings of

the two clearing houses established at Victoria and Vancouver in 1899 amounted to \$32,038,700 and \$46,161,432 respectively. The railway mileage of British Columbia at the end of the fiscal year 1900 was 1,307, as against 1,129 in 1899. (See below.) The telegraph offices numbered 30 in the same year and the total length of the lines was 691 miles, against 567 miles in 1899.

History.—Early in 1901 provincial legislation on the lines of the Natal Asiatics Immigration Law came into operation and resulted in the rejection of a number of Japanese immigrants. Chinese, whose prescriptions of entry were provided for by Dominion legislation, were enabled to evade the act. The provincial legislature was asked but failed to remove the restrictions, and the Dominion government was compelled to veto the obnoxious act. Considerable trouble was experienced on the Fraser River, the white fishermen refusing to work owing to the employment of Japanese fishermen by the canning firms. The Japanese were armed for eventualities and the provincial police patroled the river. The strike was settled by the whites' accepting the canners' proposals. The British Columbia government introduced a bill providing for the issue of a loan of \$5,000,000 for railway subsidies and other public works of government ownership. The projected railway lines consist (1) of one from the coast to Kootenay, 300 miles, with a connection to Vancouver and New Westminster and by railway and ferry to Vancouver Island and Victoria; (2) the extension of the island railway to the north for 240 miles; (3) a line to connect Rock Creek with Vernon and the Canadian Pacific railway, 125 miles; (4) a line from Kitimat on the north mainland coast to Hazelton, 100 miles; and (5) a line from Fort Steele, on the Kootenay, to Golden, 150 miles. The bonus limit per mile was placed at \$5,000; \$500,000 was provided for a bridge over the Fraser River at Westminster. The province is to receive four per cent. of the gross earnings of the railways. The reorganization of a provincial cabinet took place in August. Mr. John C. Brown became provincial secretary, replacing Mr. J. D. Prentice, who was appointed finance minister in succession to Mr. Turner, who proceeded to London as agent-general.

BRITISH EAST AFRICA. See EAST AFRICA, BRITISH.

BRITISH GUIANA, a colony of Great Britain on the northeastern coast of South America, has an estimated area of 120,000 square miles and an estimated population, at the beginning of 1900, of 287,288. The capital is Georgetown. The colony is administered by a governor (Sir Walter J. Sendall, since 1898), who is assisted by an executive council and, for legislative purposes, by committees (courts) of appointed and elected members. Revenue is derived chiefly from customs. For the fiscal year 1899 the revenue and expenditure amounted to £525,865 and £525,387 respectively; for 1900 £538,838 and £525,542 respectively. At the end of the latter year the public debt, including all local loans for which the colonial revenue is security, stood at £958,840. For the fiscal year 1899 the imports and exports were valued at £1,371,412 and £1,775,691; for 1900, the imports, which were mainly flour, rice, cotton, and woolen goods, were valued at £1,318,701, and the exports, of which seven-eighths were made up of sugar, gold, and rum, at £1,927,959. In the latter year over half the imports came from Great Britain and over a quarter from the United States; while the exports were divided almost equally between the same countries. Of the total trade 52.9 per cent. was with Great Britain, 38.9 per cent. with the United States, and 5.9 per cent with British possessions. Gold production in 1900 was 112,789 ounces. There are about 75 miles of railway. In February, 1901, an electric tramway of some ten miles in length was opened in Georgetown. In February, 1901, the governor stated that, although the revenue remained stationary, there would be a favorable balance at the end of the fiscal year, "testifying to the most rigid economy of administration," and he noted a reduction in the public debt. There was promise, he said, of important developments in agriculture, especially the cultivation of sugar and ballata, in the diamond industry, and in gold mining. The final adjustment of the boundary dispute with Venezuela should lead to the investment of new capital in the gold district; and the most effective method for the general development of the interior, that is, the construction of railroads, was planned.

During the year the British press gave considerable attention to the great possibilities of development in British Guiana. Of the small population about 90 per cent. is confined to a strip along the coast, some 200 miles in length and rarely extending more than 30 miles inland, "so that nine-tenths of the population are congregated in about one-hundredth part of the territory." More than one-third of the inhabitants are East Indian immigrants or their descendants. Since labor is insufficient even in the more thickly settled districts, it is clear that the local resources of the colony are inadequate for any considerable development of the hinterland.

BRITISH HONDURAS, or BELIZE, a crown colony of Great Britain on the Caribbean Sea, directly south of the Mexican state of Yucatan and east of Guatemala, comprises 7,562 square miles and has a population, according to the census of

1901, of 37,479. Its capital and chief town is Belize, with a population of 9,113. The colony is administered by a governor (Sir David Wilson since 1897), who is assisted by executive and legislative councils. The revenue increased from \$250,458 in 1899 to \$289,728 in 1900, and the expenditure decreased from \$262,415 to \$246,201. The dollar is the gold dollar of the United States, which was adopted as the standard unit of value in 1894. There is a paper currency (1899) of \$100,704 and a subsidiary silver currency of \$200,000 in circulation. The public debt is \$168,815. The imports, two-thirds of which are furnished by the United States, amounted to \$1,031,473 in 1899 and \$1,198,772 in 1900. The exports increased from \$1,018,044 in 1899 to \$1,300,565 in 1900, the value of the exports to Great Britain falling in the same period from \$860,378 to \$613,565. The staple products are woods, principally mahogany and log-wood. The export of mahogany, the value of which is \$40 to \$50 per 1,000 feet, amounted to 7,994,378 feet in 1901. The colonial secretary in his last annual report called attention to the fact of the poor quality of the mahogany exported, which seemed to indicate a failure in the supply of the real Honduras mahogany; the only remedy, he thought, would be improved methods of transportation, which would make it possible to tap the forests remote from the coast. Sugar and fruits are also exported. About 15,000 acres are under cultivation. Gold and silver occur, but have never been worked. On February 1, 1901, a new tariff went into effect which provided for a considerable reduction in duties.

BRITISH NORTH BORNEO. See BORNEO.

BROCK, THOMAS, R.A., the British sculptor who was selected in 1901 to execute the memorial statue of Queen Victoria, was born at Worcester, England, in 1847, the son of a decorator in that city. He was educated first in the government School of Design at Worcester, then at the Royal Academy, London, where he won both a silver and a gold medal. After studying under J. H. Foley, the sculptor, he became his assistant, and upon Foley's death completed a number of the latter's unfinished works, including the O'Connell monument at Dublin. Among Mr. Brock's ideal creations are included "Salmacis," "Hercules Strangling Antaeus," an equestrian group; "A Moment of Peril," and statuettes of "Paris" and "Enone." His "The Genius of Poetry" was exhibited at the Royal Academy in 1889. He has executed portrait statues of Richard Baxter, Sir Rowland Hill, Henry Wadsworth Longfellow (for Westminster Abbey), Sir Richard Owen, Lord Derby, and others. In 1898 five of his sculptures were placed in the National Gallery of British Art, among them a statue of "Eve."

BROGDEN, CURTIS HOOKS, ex-governor of North Carolina, died January 4, 1901. He was born on a farm in Wayne County, N. C., December 6, 1816, and spent his youth there. From 1838 to 1857 he was in either the senate or the assembly of the State, and later was State comptroller, 1857-67, presidential elector, 1869, and collector of internal revenues, 1870. In 1872 he was elected lieutenant-governor, and upon the death of his chief in 1874, conducted the administration for the remainder of the term. He was a Republican member of Congress from 1877 to 1879. Governor Brogden was active in the State militia and attained the rank of major-general.

BROGLIE, JACQUES VICTOR ALBERT, Duc de, French statesman and historian, died in Paris January 19, 1901. He was born in that city June 13, 1821, and was educated at the University of Paris. In 1871 he was elected to the Chamber of Deputies and in the same year went to London as ambassador. While in the Chamber he organized a coalition of the monarchical parties, which caused the resignation of President Thiers (1873), and the election of Marshal MacMahon as his successor. As premier in the new cabinet, Broglie incurred the enmity of a part of the monarchists, who united with the conservatives to secure his downfall. He resigned May 16, 1874, with his colleagues, but two years later was elected to the Senate and became leader of the reactionary parties (1877). A new cabinet was formed (May), in which Broglie was premier and minister of justice. At the ensuing election (November), which was bitterly contested, the Republicans were victorious, and Broglie, thus defeated, made no further attempt to exercise leadership, retiring from the Senate to private life in 1885. While notable as a statesman, M. de Broglie achieved more as a publicist and historian. As an undergraduate he published articles in the *Revue des Deux Mondes* and *Le Correspondant*, which were afterward collected under the title *Etudes morales et littéraires* (1853). Other works were *Questions de religion et d'histoire* (1860); *Le secret du roi: Correspondance secrète de Louis XV. avec ses agents diplomatiques, 1752-54* (1878); *Marie Thérèse impératrice* (1888); *Histoire et Diplomatie* (1889); and *Mémoires du prince de Talleyrand* (1891). He devoted much of his writing to defending the temporal power of the Pope, and constitutional liberalism in politics. He became a member of the Académie Française in 1862, and succeeded to his title on the death of his father in 1871.

BROOKLYN INSTITUTE OF ARTS AND SCIENCES was organized in 1824, and has twenty-eight departments, viz.: Archæology, Architecture, Astronomy, Biology, Botany, Chemistry, Domestic Science, Electricity, Engineering, Entomology, Fine Arts, Geography, Geology, Law, Mathematics, Microscopy, Mineralogy, Music, Painting, Pedagogy, Philately, Philology, Philosophy, Photography, Physics, Political Science, Psychology, and Zoology. Courses of lectures in the arts and sciences are delivered through the year; monthly meetings of each of the departments are held regularly, and concerts and dramatic readings are given at stated periods. The institute, under authority from the legislature, commenced the erection of a museum building on ground leased from the old city of Brooklyn for a term of one hundred years. The first section was opened to the public June 2, 1897. The second section, authorized by the Board of Estimate under legislative authority, was commenced in 1899, and will, it is expected, be completed in 1902. The museum is open daily from 9 A.M. to 6 P.M.; on Thursday and Friday evenings, from 7.30 to 9.15, and on Sundays from 2 to 6 P.M. A children's museum, as an auxiliary to the main museum, is also provided, and there is a laboratory for biological research located at Cold Spring Harbor, L. I. President of board of trustees, A. Augustus Healy; treasurer, W. B. Davenport; secretary, George C. Brackett. Office, 502 Fulton Street, Brooklyn Borough, New York City.

BROSIUS, MARRIOTT, American lawyer and congressman, died at Lancaster, Pa., March 3, 1901. He was born at Colerain, Pa., March 7, 1843, and received a country school education. At the outbreak of the Civil War he joined the 97th Pennsylvania Infantry, and served until he was wounded in 1863. At the close of the war he studied for a time at the Millville, Pa., Normal School, and afterward studied law at the University of Michigan, graduating in 1868. He commenced to practice at Lancaster, and was elected to Congress as a Republican from that district, in 1890. He served there until his death, and during 1895-97 was chairman of the committee on reform in the Civil Service. As chairman of the committee on banking and currency during 1899-1901, he was officially responsible for the form of the present gold-standard law.

BROTHERHOOD OF ANDREW AND PHILIP. See **ANDREW AND PHILIP, BROTHERHOOD OF.**

BROTHERHOOD OF ST. ANDREW. See **ST. ANDREW, BROTHERHOOD OF.**

BROWN UNIVERSITY, Providence, R. I., founded in 1764, had in 1901 a faculty of 87 and a student body of 899. This is an increase over the previous year of 10 members of the faculty and 27 in the student body. Of the students, 77 were graduate students and 177 were students in the Woman's College. The most important event of the year in a material way was the continued success of the movement to increase the endowment fund. During the year there was a cash increase of productive funds of \$576,780, and subscriptions and non-productive gifts completed the desired increase of \$2,000,000. In this sum is included the most valuable gift of all, the John Carter Brown Library, together with \$500,000 for maintenance, and \$150,000 for the erection of a library building, given by Mr. John Nicholas Brown. The John Carter Brown Library is one of the most extensive and probably the most valuable collection of Americana in existence. Its collection had been the work of a century and its contents have been used by all the great writers of American history and by many foreign governments both in Europe and in South America. The material equipment of the University has also been increased by the completion of the memorial gates, the administration building, the president's house, and the chemical laboratory. While at present the University buildings are characterized by the heterogeneousness, common to most of the large colleges in the east, due to their erection without reference to a general scheme of development, a general plan for the location and the architecture of future additions to the plant has been adopted.

The year was also marked by a great number of changes in the faculty. Professor William McDonald, of Bowdoin College, replaced Professor John Franklin Jameson, called to the University of Chicago, in the chair of history. Other appointments were Dr. Albert D. Mead to head professorship in biology, Professor H. F. Fowler to the professorship in Biblical literature, Professor J. E. Bucher, Jr., to a professorship in organic chemistry, Thomas Crosby, Jr., to a professorship in English and public speaking, and a number of appointments to instructorships. The educational policy of the institution shows development along the lines marked out in 1900; there is a general raising of standards for admission, but at the same time a withdrawal of Greek as a required subject for admission, its place being taken by the modern languages. A most important and significant change was the agreement entered into between the University and the city of Providence in regard to the public school system. By the terms of this agreement, the professor of education of the University becomes the "director of the training department" of the public schools, and is given general charge of all student teachers; a certain number of graduate students are

given positions in the High School under the direction of supervising teachers selected from the regular teaching staff of the High School, and are to receive a salary of \$400; a larger class of student teachers are to do observation and practice work of a more limited character without remuneration; students who have pursued the education courses are eligible to similar position in the grammar and elementary schools; a limited number of seniors in the department of education in the University are also allowed to teach and observe in the grammar schools. This solution is one of the best that has been offered for the vexed problems of combining the professional and the liberal training of the teaching profession, and its results will be observed by other universities with the greatest interest.

BROWNE, Sir SAMUEL JAMES, British general, died in the Isle of Wight, March 14, 1901. He was born in India, October 3, 1824, and entered the army there in 1840, receiving a commission four years later. For forty years he was in active service, and distinguished himself in the second Sikh War, 1848-49, the Sepoy Mutiny, 1857-59, during which he lost an arm, and the campaign against Shere Ali, Ameer of Afghanistan, 1878. He was frequently mentioned in despatches for bravery, received the Victoria Cross, and was made a Grand Commander of the Bath and a Knight Commander of the Star of India for distinguished services.

BROZIK, WENCESLAS, Bohemian painter, died in Paris, April 15, 1901. He was born near Pilsen, Bohemia, in 1851, studied at *l'Ecole des beaux-arts* of Prague, and in the Academy at Munich, and in 1876 went to Paris. He first exhibited at the Salon of 1877, showing two large canvasses illustrative of Bohemian history, "The Departure of Dagmar, Daughter of the King of Bohemia, Betrothed of Valdemar, King of Denmark (1205)," and "Episodes of the Wars with the Hussites (1419)." Among other historical paintings, he exhibited in 1878, "Ambassadors of the Dead King Ladislas to the Court of Henry VII," which was acquired by the National Gallery of Berlin. Turning to portraiture in 1880, he exhibited the "Portrait of M. G., General in the Chinese Army." M. Brozik was decorated by the Legion of Honor in 1894. His work is remarkable for clearness of accessory detail, and careful costuming.

BRUNEL. See BORNEO.

BRYN MAWR COLLEGE, Bryn Mawr, Pa., near Philadelphia, a leading woman's college, was opened in 1885. During 1901 the combined enrollment of the undergraduate and graduate schools was 417. The college has a faculty of 40 members, who give their whole time to instruction, in addition to two non-resident professors and ten academic officers. It has a library of about 36,000 volumes, and a plant valued at about \$1,000,000, including a campus of 52 acres of ground. Most of the students are housed in the dormitories, and one of the great needs of the institution is for more buildings of this character. The most important event of 1901 was the conditional gift of \$250,000, made by Mr. John D. Rockefeller, for supplying the needs of certain new buildings. The condition is that a similar amount be subscribed by other friends of the institution before the end of the collegiate year in June, 1902. Many conditional subscriptions were made during 1901, and at the close of the year every effort was being put forth to comply with the conditions of the gift.

BUBONIC PLAGUE. See PLAGUE.

BUCHANAN, ROBERT WILLIAMS, English novelist, poet, and playwright, died at Streatham, England, June 9, 1901. He was born in Glasgow, Scotland, August 18, 1841, and was educated at the Glasgow Academy, High School, and University. Going to London from the university (1860) he published his first collection of verses, *Undertones*, in 1863. Other volumes that fixed his place as a poet are *London Poems* (1866); *Napoleon Fallen*, a lyric drama (1871); *Ballads of Life, Love, and Humor* (1882); and *The City of Dream* (1888). Mr. Buchanan published a number of novels, including *St. Abe and His Seven Wives* (1872); *The Shadow of the Sword* (1876); *God and the Man* (1881); and *The Master of the Mine* (1885). In 1880 he began to write plays, making his greatest success with *Sophia*, an adaptation from *Tom Jones*. He also wrote critical essays, and in 1871, published in the *Contemporary Review* under the pseudonym of "Thomas Maitland," *The Fleshly School of Poetry*, a diatribe attacking what he called the sensuousness of the poems of Dante G. Rossetti and Swinburne. Replies from the attacked, under the titles of *The Stealthy School of Criticism* and *Under the Microscope*, respectively, marked a controversy in letters that will preserve Buchanan's name as effectively as any of his own works. Convinced of the injustice he had done, he retracted much of his charge, and dedicated his *God and the Man* to Rossetti. It was Buchanan's diffusion of energy, perhaps, that prevented his achievement of marked success in any of the lines he followed; each showed promise that was never fulfilled. Business reverses left him toward the close of his life with very straitened means. He visited this country in 1884-85.

BUCKWHEAT. The production of buckwheat in the United States has been small for the past 30 years, as compared with the 4 years immediately succeeding the Civil War. The acreage, which was 1,028,693 acres in 1869, fell to 536,992 in 1870, and the largest since then was 917,915 acres in 1886. The preliminary estimates for 1901, which are the only data available, indicated an increase of about 43,000 acres over the preceding year, or a total of about 681,000 acres. There was an increase in New York and Pennsylvania (which together contain about 76 per cent. of the total acreage of this crop) of about 58,000 acres, while the majority of other buckwheat-producing States reported diminished acreage. The preliminary estimates of the average yields an acre by States in 1901 were as follows: Maine, 31.7 bushels; New Hampshire, 21.0; Vermont, 25.1; Massachusetts, 18.9; Connecticut, 18.0; New York, 18.8; New Jersey, 19.0; Pennsylvania, 19.5; Delaware, 17.8; Maryland, 17.5; Virginia, 15.9; North Carolina, 15.6; Tennessee, 14.2; West Virginia, 26; Ohio, 16.1; Michigan, 14.1; Indiana, 13.1; Illinois, 11.0; Wisconsin, 12.4; Minnesota, 14.5; Iowa, 13.5; Missouri, 6.0; Nebraska, 11.5; and Oregon, 11.7. The average yield for the United States was 18.9 bushels an acre, as compared with 15 bushels in 1900, and 16.9 bushels for the past 10 years. Of the six States having 10,000 acres or upwards (i. e., Maine, New York, Pennsylvania, West Virginia, Michigan, and Wisconsin) four reported a yield an acre in excess of their average for 10 years. The quality of the 1901 crop was rated as 93.3 per cent. as compared with 90.2 for 1900. The total production in Ontario, Canada, was 1,759,071 imperial bushels, a decrease of over 6 per cent. in comparison with the previous year.

The exports of buckwheat from the United States since 1897 have been nearly a million and a half bushels annually, but in 1900 the amount declined to 426,822 bushels, valued at \$254,847, and in 1901 there was a further reduction to 123,540 bushels, valued at \$79,120. The buckwheat exported in 1901 was sent chiefly to the Netherlands, the shipments to that country amounting to 106,794 bushels, valued at \$68,565. Germany, which received the next largest shipments, took only 10,437 bushels, valued at \$6,666. No importations of buckwheat into the United States have been reported in recent years. Buckwheat middlings and bran, by-products in the manufacture of buckwheat flour, are coming into rather general use for feeding in the regions where they are produced. The middlings are fed to cows usually, and have been found to have a high feeding value. The bran consists of a mixture of the middlings and hulls, and as the latter are practically useless the bran, although a fair feed, is inferior to the middlings.

BUILDING STONES. The value of the building stone produced in the United States in 1899 and 1900 was as follows:

	1900.	1899.		1900.	1899.
Granite	\$10,969,417	\$10,343,298	Bluestone	\$1,198,519	\$815,284
Marble	4,267,253	4,011,681	Limestone	20,354,019	18,757,963
Trap	1,706,200	1,275,041			
Slate	4,240,466	3,962,733			
Sandstone	5,272,865	4,924,670		\$48,008,739	\$44,090,670

This shows a gain of \$3,918,069 over 1899. Massachusetts was the largest producer of granite, Vermont of marble, Pennsylvania of slate and limestone, Ohio of sandstone, and New York of bluestone.

BULGARIA. An autonomous Balkan principality under the suzerainty of Turkey. The capital is Sofia.

Area and Population.—The estimated area of Bulgaria proper is 24,380 square miles, and of the incorporated state of Eastern Roumelia, 13,700 square miles. The total population on January 1, 1893, was 3,310,713, and on March 31, 1900, 3,733,189. The national religion is the Orthodox Greek, but since 1870 the Bulgarian Church has not been included in the Orthodox communion. In 1899 there were 4,589 elementary schools with 345,887 pupils. There are also a number of schools for secondary instruction, and at Sofia a university with 409 students in 1900.

Government and Finance.—The chief executive authority is a prince (Ferdinand I., son of the late Prince Augustus of Saxe-Coburg and Gotha, since August, 1887), who is assisted by a cabinet nominated by himself and responsible to the Sobranje. In this body, a single chamber, is vested the legislative power. The strength of the army on a war footing is placed at 209,000 men. The navy is inconsiderable. The unit of value is the lev, worth one franc, or 19.3 cents. The largest item of revenue is direct taxes; the heaviest expenditures are for service of the debt and war. The estimated revenue and expenditure for 1899 were 84,097,105 leva and 84,035,514 leva, respectively; for 1900, 83,827,863 leva and 83,270,370 leva; for 1901, 95,286,000 leva and 95,350,000 leva. In 1899 steps were taken toward converting the entire national debt into a new 5 per cent. loan of 260,000,000 leva.

Industries, Commerce, etc.—Agriculture is the most important industry, and wheat the chief product. Other important products are wine, silk, tobacco, and attar of roses. Manufactures include various textiles, tobacco goods, and alcoholic liquors. In 1900 the amount of attar of roses distilled was about 4,360,000 grammes, an increase of 50 per cent. over the production of 1899. The principal export is wheat, and the leading imports textiles and metal goods. The imports and exports in 1898 amounted to 72,730,250 leva and 66,537,007 leva respectively; in 1899, imports 60,178,079 leva, and exports 53,467,099 leva. According to a British report Austria-Hungary stood first in 1900 in the import trade with £505,655, Great Britain second, and Germany third with £224,599. British trade is declining; imports from Great Britain fell from £498,000 in 1899 to £301,150 in 1900, and the former figure was smaller than that for 1898. About 40 per cent. of the exports go to Turkey; the countries next in order in the export trade are Great Britain, France, and Austria-Hungary. In 1900 there were 909 miles of railway in operation and 130 under construction. The state telegraph lines had a total length of 3,270 miles in 1899, and the state telephone lines 1,228 miles.

Events of 1901.—The resignation of M. Ivanschoff's cabinet was accepted in January, 1901, and a provisional cabinet for the transaction of public business until after the elections to the Sobranje was formed by M. Petroff, a former minister of the interior. On February 20 the elections took place, with the following results: Stambuloffists, 38; Zankoffists (Russophil), 32; Karaveloffists, 26; Stoiloffists, 24; Agrarians, 14; Independents (the Petroff party), 14; Turks, 9; followers of Radoslavoff (whose ministry resigned December 5, 1900), 6; Socialists, 4. On February 26 the Petroff cabinet resigned, and on March 4 Prince Ferdinand, upon the coalition of the followers of M. Zankoff and M. Karaveloff, sanctioned a new ministry of the following composition: M. Karaveloff, premier and minister of finance; M. Daneff, foreign affairs; M. Sarafoff, the interior; General Paprikoff, war; M. Radeff, justice; M. Ludskanoff, commerce; M. Slaveikoff, education; M. Belinoff, public works. M. Petko Karaveloff, who returned to power after an interval of fifteen years, was premier at the time of Prince Alexander's abduction. Subsequently he became a member of the Regency of Three, over which Stambuloff presided, but, quitting the Regency, he was soon imprisoned; and he was again imprisoned after the assassination of M. Beltcheff, but was liberated after the fall of Stambuloff. The extreme democratic and socialistic opinions of M. Karaveloff, who for a number of years has endeavored to regain political prestige, have been widely accepted in the rural districts of Bulgaria. The Sobranje convened on March 7. In September the premier stated that his chief ambition was to place Bulgarian finances on a sound basis, and this he expected to accomplish within two years. There appeared to be, however, greater difficulties than the premier had anticipated. In December it was announced that he had signed a contract with the Bank of Paris and the Netherlands for a new loan of 125,000,000 francs. Later in the month, by a majority of three votes, this contract was rejected by the Sobranje, whereupon the premier announced the suspension of the session and a dissolution of the Sobranje seemed imminent. Near the end of the year the Karaveloff ministry resigned, although the payment of the obligations, amounting to 10,000,000 francs and due on January 15, 1902, which it had been striving to meet, seemed assured. On September 7, the Sobranje decided to lay before the supreme court the charges against the members of the Ivanschoff ministry for violation of the constitution and misconduct in connection with the purchase of materials for the state railways. On July 11, 1901, the Grand Duke Alexander Mikhailovich, cousin and brother-in-law to the Czar, made an official visit to Prince Ferdinand—the first royal visit ever received by the Prince. The occasion had no apparent political significance beyond emphasizing the recognized fact of the preponderance of Russian influence in Bulgaria. This influence has been gradually increasing since the death of Stambuloff (1895). In September, 1901, the premier, M. Karaveloff, stated that Bulgaria, while desiring to be on good terms with all other countries, preferred the friendship of Russia.

During 1901 the propaganda of the Macedonian Committee (headquarters at Sofia) was continued, though apparently with small success. The aim of the committee, it will be remembered, is to effect reforms in the Ottoman vilayet of Adrianople and the Macedonian districts of Turkey, and ultimately to annex Macedonia to Bulgaria. These districts are inhabited largely by Wallachs, who oppose annexation, preferring to remain under Turkish authority, which, they hope, may be supervised by the powers. The plans of the committee also meet the disapproval of Roumania and Serbia, who fear Bulgarian aggrandizement. The committee works almost entirely *sub rosa*, fearing on the one hand the suzerain power of Turkey, which of course opposes its plans, and on the other hand the Bulgarian government itself, which, notwithstanding its alleged sympathy with the purpose, if not the practice, of the committee, does not dare openly to support the annexation scheme.

On March 27, 1901, a small band of Bulgarians attempting to enter Macedonian

territory, were defeated and driven back by Turkish troops. About the first of April the trial of 19 Bulgarians charged with revolutionary proceedings was concluded; 5 were acquitted, 11 sentenced to life servitude, and 3 condemned to death. In April the Bulgarian government forbade the meeting of the Macedonian committee, and on the fifth of the month all the prominent members of the committee in Sofia, including M. Saraff, the president, were arrested. As a result, on April 15, a mass-meeting of some 10,000 persons took place at Sofia to protest against the arrests and to express disapproval of the attitude of the Russian government on the Macedonian question. The meeting also proposed to appeal to the powers for intervention against the persecution of Bulgarians in Turkey. Similar meetings were held in provincial towns. Subsequently the moderate party in the committee, as against the extremists, represented by M. Saraff, elected M. Michailovski president of the managing committee. On August 14 M. Saraff and the other members of the committee charged with the murder of Professor Michailiana and M. Fitofski were acquitted. Meanwhile Turkish severities were taking place in Macedonia, and there were numerous arrests and convictions of persons accused of complicity in the designs of the Macedonian committee. The agents of the committee were said for the most part to be ordinary criminals. On October 5 a mass-meeting, comprising, it was said, some 20,000 persons, protested against the persecution of Bulgarians in Kastoria and called upon the Bulgarian government to appeal to the Porte. On the other hand it was reported late in December that through the agency of the Macedonian committee the persecution of Greeks for the purpose of compelling them to submit to the authority of the Bulgarian Church, had reached such a point that the Greek Patriarch had formally protested to both the Porte and the Russian ambassador at Constantinople. Moreover, at the close of the year, the Turkish commissioner at Sofia entered protest with the Bulgarian government regarding the committee. On the ground that the actions complained of had taken place in Turkish territory, the Bulgarian government repudiated responsibility. In November M. Daneff, minister for foreign affairs, said that no improvement in the relations of Bulgaria and Turkey were possible so long as the existing conditions in Macedonia continued, and he added that when the terms of the Treaty of Berlin should be carried out, the Macedonian committee would disappear. For the abduction of Miss Stone, the American missionary, by alleged agents of the committee, see **TURKEY**.

BUNCE, FRANCIS MARVIN, rear-admiral U. S. N. (retired), died at Hartford, Conn., October 19, 1901. He was born at Hartford, December 25, 1836, and graduated at the United States Naval Academy in 1857. Throughout the Civil War his services were varied and distinguished. As executive officer of the *Penobscot* he took part in the engagement with the Confederate batteries at Yorktown in 1862, and in the same year was in command of a successful expedition up Little River, between the Carolinas. In 1863 he was made a lieutenant-commander, conducting the naval attack on Morris Island, for which he was honorably mentioned by Admiral Dahlgren. A few months later he was placed in command of the monitor *Patapsco* in the siege of Charleston, where he was wounded, and after service on the monitors *Katskill*, *Lehigh*, and *Dictator* he was ordered to the *Monadnock*. He took the *Monadnock* from Philadelphia to San Francisco in 1865, demonstrating the ability of monitors to make long sea voyages. For this service, as remarkable as Captain Clark's voyage with the *Oregon* from San Francisco to Key West in the Spanish-American War of 1898, he was thanked by the secretary of the navy and recommended to the President for reward. The command of the *Atlanta*, the first of the new cruisers, was given to him in 1886, and in 1895 he was placed in command of the North Atlantic Squadron. In 1897 he became commandant of the Brooklyn Navy Yard, retaining the post after his retirement (1898), and performing valuable service in converting steamers and yachts to auxiliary cruisers for use in the war with Spain. His promotions occurred, to commander, in 1871; to captain, in 1883; to commodore, 1895; and to rear-admiral, in 1898.

BURGESS, Rt. Rev. ALEXANDER, Protestant Episcopal bishop of Quincy, Ill., died at St. Albans, Vt., October 8, 1901. He was born at Providence, R. I., October 31, 1819, and was educated at Brown University, graduating in 1838, and at the General Theological Seminary, where he graduated in 1841. Ordained a priest in 1843, he filled pastorates at Augusta and Portland, Me., was rector of St. John's Church, Brooklyn, N. Y., and of Christ Church, Springfield, Ill., which charge he held in 1878 when he was consecrated first bishop of Quincy, Ill. Bishop Burgess published a *Memoir of the First Bishop of Maine* (1869), a biography of his brother, Rev. George Burgess (1809-66), besides a number of sermons, addresses, and hymns.

BURMA, a province of British India lying between China and the Bay of Bengal, consists of Upper Burma, Lower Burma, and the Shan States. The estimated area of Upper Burma is 83,473 square miles, and the population, according to the census of 1901, 3,849,833, as against 2,046,933 in 1891; Lower Burma, 87,957 square miles with 5,371,328 inhabitants, as against 4,658,627 in 1891; the Shan States, about

40,000 square miles, with 1,228,460 inhabitants; total, upwards of 211,000 square miles, and 10,449,621 inhabitants in 1901. The people are mostly Buddhists. The chief town of Upper Burma is Mandalay (population, 182,498), and of Lower Burma Rangoon (population, 232,326). The province is administered under the Indian government, by a lieutenant-governor, Sir Frederic W. R. Fryer since 1897. The money of account is the silver rupee, which is valued at one-fifteenth of a British sovereign, or about 31 cents. The revenue for the fiscal year 1899 was reported at R x. 6,989,040, and the expenditures R x. 4,462,922 (R x. signifying 10 rupees). The foreign trade (that is, trade with all countries except India) by sea has increased remarkably in recent years. The foreign imports in the fiscal year 1901 amounted to R x. 6,870,000, as against R x. 4,870,000 in 1900. The foreign exports showed a slight decline, from R x. 10,780,000 in the fiscal year 1900 to R x. 10,030,000 in 1901; this falling off was due to the large quantities of rice diverted from foreign markets to India on account of the famine in that country. The trade with India (imports and exports) by sea in the fiscal year 1901 was valued at R x. 17,740,000, as against R x. 14,070,000 in the preceding year; of this increase R x. 2,330,000 represented increased shipments of rice to India. From the foregoing figures it appears that the total trade of Burma by sea amounted to R x. 34,640,000 (about \$112,233,000). It is worthy of note, in comparison, that the total trade in the fiscal year 1871 was reported at R x. 6,930,000; in 1881, R x. 14,000,000; in 1891, R x. 23,000,000. Of the imports in the fiscal year 1901 Great Britain sent about 60 per cent., and of the exports received about 20 per cent. Following, in order of importance, excepting India, were Egypt, the Straits Settlements, Germany, Japan, Belgium, the Netherlands, France, the United States, and China. In addition to the trade by sea may be mentioned the overland trade with China, the imports in the fiscal year 1901 amounting to R x. 286,500, and the exports R x. 321,000. The principal export is rice; the quantity sent to foreign countries in 1901 being valued at R x. 7,920,000 and to India R x. 7,360,000—the total amounting to about \$49,407,000. The export next in importance is teak. The three principal places in the world from which this wood is exported are Rangoon, Moulmein, and Bangkok (Siam). The shipments from Rangoon are by far the largest, while those from the other two ports are about equal. In 1899 there were 936 miles of railway open to traffic, and since that time a considerable mileage has been completed. On June 1, 1901, the lieutenant-governor formally opened the Gokteik viaduct and railway to Thibaw. In his visit to Burma in the fall of 1901, Lord Curzon, the Indian viceroy, emphasized the desirability of developing internal communications. In 1901 there appeared to be a growing dissatisfaction among the Kachins on the China frontier, who suffered from the incursions of the trans-frontier Kachins, while neither the Chinese nor the British authorities seemed able to give them relief.

BUSIEL, CHARLES ALBERT, former governor of New Hampshire, died at Laconia, N. H., August 29, 1901. He was born at Meredith, N. H., in 1842, and was educated at the Gilford Academy. He became a manufacturer, was interested in banking, and was for a time president of the Lake Shore Railroad. He was a member of the State legislature (1878-79), delegate to the National Democratic Convention in 1880, mayor of Laconia (1893-94), and governor of New Hampshire (1895-96). He was an unsuccessful candidate for United States Senator in 1896. At first a Democrat in politics, he changed his views later and was elected governor on a Republican ticket.

BUTLER, NICHOLAS MURRAY, professor of philosophy and education in Columbia University, New York City, was chosen acting president of that university in October, 1901. Upon the resignation of President Seth Low (*q.v.*) to accept the Fusion nomination for mayor of New York City, the trustees of Columbia selected Mr. Butler to act as the university's head, and after the former's political victory, Mr. Butler succeeded him as president. He was born at Elizabeth, N. J., April 2, 1862, and graduated at Columbia in 1882. In 1885 he became an assistant in philosophy, and rose to be dean of that department in 1890. In 1895 he became president of the National Educational Association and editor of the *Educational Review*. He is widely known for his educational work, and has published *The Meaning of Education*, and *Monographs on Education in the United States*, besides editing the *Great Educators Series*, and the *Columbia University Contributions to Philosophy and Education*.

BUTTERFIELD, DANIEL, major-general U. S. A. (resigned), died at Cold Spring, N. Y., July 17, 1901. He was born at Utica, N. Y., October 31, 1831, and graduated at Union College in 1849. Joining his father, who founded the American Express Company, he devoted himself to business until he entered the New York State militia, serving from 1851 to 1861, when, as colonel of the Twelfth New York Regiment, he joined the Union Army. General Butterfield took part in twenty-eight engagements during the Civil War, winning a medal of honor from Congress for

gallantry in action at Gaines' Mill in the peninsular campaign. He rose in rank until at the end of the war he had attained the rank of major-general of volunteers, and at the time of his resignation had received the brevet ranks of brigadier-general and major-general in the regular service. At the close of the war he was appointed superintendent of the general recruiting service of the army, and was put in command of the forces in New York Harbor, serving there from 1865 to 1869. In this latter year he resigned to become assistant treasurer of the United States in charge of the sub-treasury at New York.

CABLE, GEORGE WASHINGTON, the author of many familiar stories of Creole life in New Orleans, published in 1901 *The Cavalier*, a novel dealing with the South during the Civil War. The book is a sympathetic study of the spirit of the men who fought through the war on the Confederate side, and of the fortitude of the women who encouraged them in the long struggle. Mr. Cable was born at New Orleans, October 12, 1844, and was educated in the public schools of that city. From 1863 to 1865 he served in the Confederate army, in the Fourth Mississippi cavalry, and from the close of the war till 1879 he was on the staff of the New Orleans *Picayune*. Among his published books are *Old Creole Days*, *The Grandissimes*, *The Silent South*, *Dr. Sevier*, *The Negro Question*, and *Strong Hearts*.

CAINE, THOMAS HENRY HALL, the author of a number of successful novels, published in 1901, *The Eternal City*, a novel dealing with modern Italy and the conflict of church and state at Rome. The book attained a wide circulation, and while its value as a study of modern Italian life has been questioned, as melodrama it ranks with the author's other successes. Mr. Caine was born on the Isle of Man, May 14, 1853, and was educated there and at Liverpool. Trained as an architect, he soon abandoned that profession and became a writer for the Liverpool *Mercury*. He began his literary career by publishing, in 1882, *Sonnets of Three Centuries*. His most popular novels are *The Deemster* (1887), *The Bondman* (1890), *The Manxman* (1894), and *The Christian* (1898).

CALIFORNIA, a Pacific coast State of the United States, has a land area of 155,980 square miles. The capital is Sacramento. California was admitted to the Union September 9, 1850. The population in 1900 was 1,485,053, while in June, 1901, as estimated by the government actuary, it was 1,514,000. The populations of the four largest cities in 1900, were: San Francisco, 342,782; Los Angeles, 102,479; Oakland, 66,960; and Sacramento, 29,282.

Finance.—On January 1, 1901, there was a balance in the treasury of \$7,412,229.94. The receipts for the year ending December 31, 1901, were \$9,863,617.14, making a total of \$17,275,847.08. The expenditures for the year were \$10,044,918.08, leaving a balance in the treasury December 31, 1901, of \$7,230,929. The State debt at the end of the year was \$2,281,500, all bonded. This was neither increased nor diminished during 1901. All the funded debt bonds are owned by the State and held in trust for the schools and the State university, and the interest paid at the rate of 6 per cent. per annum, is applied to the support of the schools and the university. Practically, the State has no debt. The State tax rate for the year 1901-02 is \$.0048 per \$1.00, while the total value of State property, as returned for taxation, is \$1,241,705,803. For the banking interests of California, see article BANKS—BANKING.

Mining.—The value of the mining products of California, which for many years after the rapid exploitation of gold between 1852 and 1860, showed a marked decrease, has again increased of late years, though the former totals have not again been equaled. In 1852, the output of gold alone was valued at \$81,294,700, but from then on the value of the gold production declined and Colorado came to take the place of California as the first gold-producing State. The total value of all minerals produced in California in 1900 was valued at \$32,622,945, an increase of nearly 50 per cent. for 1893, when the output was valued at \$18,811,261. Gold, however, still remains the most valuable mining interest of the State, the yearly output being between \$16,000,000 and \$17,000,000. Second in value to the output of gold is that of copper, the principal minerals in the order of their commercial importance being gold, copper, petroleum, silver, quicksilver, and borax. Marked advances were made in 1901 in the mining of copper, petroleum, and quicksilver. The value of petroleum to Californian industries is much greater than its actual commercial value for the reason that the high prices for coal have heretofore acted to check the development and expansion of industrial and manufacturing concerns. The oil-producing wells in Los Angeles, Ventura, and Santa Barbara counties have proved extremely profitable, since the oil may be shipped either by rail or by water, and low transportation rates have thereby been insured. In Fresno and Kern counties in the interior, however, there has been much discontent over the railroad rates, and to avert these, pipe lines have been projected to the coast. Many new mines have been opened for the production of copper. In 1900 the copper output was valued at \$4,748,242, and it is believed that this value will be considerably increased in 1901. This industry has had

CALIFORNIA OIL FIELDS.—Wells in City of Los Angeles (Upper). Wells at Summerfield (Lower).

Courtesy National Oil Reporter.

also a stimulating effect on the development of gold quartz mines since quartz ore is greatly in demand for flux in the copper smelters. A large number of old quicksilver mines have also been reopened during the year and new locations prospected. For many years California has produced practically all of the quicksilver of the United States, but for several years past this industry was considerably neglected. Concerning the mining industry in general, it is said that California, unlike several other States and Territories in which there are large mining resources, has been able to attract, especially of recent years, an abundance of capital for the erection of modern reducing works and for the sinking of shafts where the mineral is not immediately accessible. By means of this capital it is asserted that mines producing a variety of minerals which had previously been closed and considered worked out, are now being made to pay a large profit. See articles GOLD, SILVER, PETROLEUM, COPPER, etc.

Industries.—Although California is an agricultural and mining State, the census reports for 1900 show that there has been a large growth in mechanical and manufacturing industries during the last fifty years. The population since 1850 has increased from 92,597 to 1,482,179, or 1,500.7 per cent., while the average number of industrial wage earners has increased from 3,964 to 91,047, or 2,196.8 per cent., embracing in 1900, 6.1 per cent. of the entire population. In 1900 there was invested in the 12,582 manufacturing establishments reporting a capital of \$205,395,025 exclusive of capital stock; the gross value of the products of these establishments was \$302,874,761, while the net products, exclusive of articles re-used in the process of manufacture was \$175,425,385. Four important conditions have at once limited the growth of manufactures in California and have determined in large measure the particular lines established. These conditions are the geographical position of the State, the high rate of wages, the high price of fuel, and the large resources of the State in mining and agricultural products. California is removed at once from the commercial centres of the United States and from the important markets of the world by great stretches of land and water. As a result of this, protection from outside competition has been insured and at the same time a steady but somewhat restricted home demand has developed for the products of local factories. On the other hand, the high price of fuel has combined with the high rates of transportation to restrict the building up of great industries. Coal delivered in San Francisco in June, 1900, cost from \$7.25 to \$8.50 a ton, or nearly three times the cost of coal in New York. It has recently been discovered that California possesses abundant stores of petroleum (see paragraph Mining), and this may practically solve the fuel problem. The largest manufacturing industry in the State is the refining of sugar and molasses, with products valued in 1900 at \$15,909,998, a decrease from 1890 of \$6,763,852. The prominence of this industry is due to the fact that San Francisco is the nearest port of entry for the raw sugar of the Hawaiian Islands. The second industry in importance is that of slaughtering and meat packing, with products valued in 1900 at \$15,717,712, an increase during the decade of \$5,948,154. Lumber and timber products in 1900 showed a value of \$13,764,647, an increase during the decade of \$4,969,992. The lumber industry is confined mainly to that section of the State lying north of Fresno County and west of the Sierra Nevada and centering in the red wood district in the counties of Humboldt and Mendocino. Flour and grist mill products were valued in 1900 at \$13,100,944. This industry supplies practically all of the flour used in the State, but the production for export has declined, owing to the opening of grain fields in other parts of the world and to the introduction of improved means of transportation, which has not proportionately benefitted California. The canning and preserving of fruit products in 1900 were valued at \$13,081,829. This shows an increase since 1890 of \$6,870,389, or 110.6 per cent. Another industry that has shown large growth is that of the manufacture of foundry and machine shop products, whose values in 1900 were placed at \$12,047,149. The demand for mining and agricultural tools and machinery and the heavy cost of importing them has been the foundation of this industry. California is the great grape growing region of the United States, and this has tended to stimulate the manufacture of liquors whose values in 1900 were estimated at \$9,261,600. Other industries are that of car construction and general steam railroad work with products in 1900 valued at \$7,553,626; the tanning and finishing of leather with products valued at \$7,405,981, the printing and publishing of newspapers with products valued at \$6,858,192, and the manufacture of explosives used largely in mining, with products valued at \$4,283,818.

Forests.—Congress was petitioned by the legislature to make laws providing for the inauguration of a system of forestry in California for the protection and utilization of the government forests. It was stated that the United States owned in California 8,000,000 acres of forest reserves, and that more timber was destroyed there every year by fires than was needed for five years of economical use; that if roads were constructed through the forests to protect them from fire and make them

accessible, and if the services of trained foresters were obtained, not only would employment be given to hundreds of men, but sufficient income would be produced to enable the government to buy up without additional outlay all the immense groves of giant trees existing nowhere else in the world except California, and at present owned by private parties.

The Citrus Industry.—In view of the discussions throughout the country as to the expediency of lowering the tariff provided for in the Dingley Bill, or, at any rate, of negotiating the pending reciprocity duties with foreign countries, the California legislature passed a resolution petitioning Congress to refuse, at any rate, to ratify the reciprocity treaty with Jamaica, admitting oranges to the United States on favorable terms. The orange and lemon industry was asserted in this resolution to be the leading industry of southern California, built up by thirty years of effort and at large expense, supporting 300,000 people, and representing over 3,000,000 bearing trees. If, it was said, the Jamaica treaty was ratified, grave injury would be worked to this industry because fruit rates from California to the east were much higher than freight rates to the United States by steamer from European ports and the West Indies; and it was only by means of the Dingley tariff, which equalized the freight rate to the east by increasing the duty on foreign fruit that the industry in California was enabled to hold its own.

Stanford University.—In accordance with a constitutional amendment adopted in November, 1900, authorizing the exemption from taxation of the property of the Leland Stanford, Jr., University, the legislature enacted a law in 1901 giving Stanford full powers and privileges of a corporation, allowing it, that is, to accept and hold the Stanford lands and gifts, and also exempting from taxation all the buildings and bonds held for the benefit of the institution; but providing, at the same time, that all other property of the university, real and personal, should be subject to State and county municipal taxation. The passage of this law, for which there had been agitation on the part of the university authorities since the founding of the institution, was said to be of very great advantage to it. For the law in effect permitted the university to use the entire interest from the beneficiary funds to increase the efficiency and enlarge the scope of its educational work.

Municipal Laws.—A law was passed permitting municipalities to issue bonds and incur indebtedness to the extent of 15 per cent. of the assessed value of the taxable property of the city for the purpose of constructing or acquiring municipal improvements, such as bridges, water supplies, sewerage, schoolhouses, fire apparatus, etc. And in order to protect the city from rapacious capitalists when it appeared inexpedient for the city to acquire franchises itself, it was provided that in all cities and towns franchises of all public or quasi public utilities should be sold after advertisement to the highest bidder; the price paid for the franchise was to be immediately paid to the city in cash, and the corporation buying the franchise was to further agree under penalty of forfeiture of the franchise to pay to the city after the first five years, and annually thereafter during the life of the franchise, 2 per cent. of the gross receipts of the corporation acquiring the same.

Labor Laws.—A law similar to one enacted in New York (see NEW YORK, paragraph Rate of Wages Law), and declared unconstitutional by the Court of Appeals of that State, was passed by the California legislature in 1901. This law, besides prescribing that laborers on public works should not be required to work more than eight hours a day, provided that all contracts made with contractors on behalf of the State or any political subdivision thereof, should contain an agreement by the contractor that he would not work his men more than eight hours a day, and that he would pay forfeit if he violated his contract in this particular. By another law, a fireman's relief, health, and life insurance, and pension fund was created in the several cities, counties, and towns of the State. It was also enacted that policemen in cities should not work more than eight hours a day, and it was alleged one of the effects of this law would be the employment of 200 more patrolmen in the city of San Francisco alone. By another law, an attempt was made to protect workingmen from the competition of convict-made goods, it being made unlawful for convicts to work on stone cutting or stone dressing, and made unlawful also for any person to sell in the State "any article or articles manufactured wholly or in part by convict or other prison labor, except articles the sale of which is specifically sanctioned by law." For the protection of minors, a law was enacted that no person under eighteen should be employed in any manufacturing, mercantile, mechanical, or other establishment more than 54 hours a week, that children under 12 should not be employed at all, and that employers having employees under 16 should keep a notice posted showing the age and hours of work of such employees. At the same time that an endeavor was made to limit the utility of convict labor, an endeavor was also made to restrict the labor of aliens, it being provided that no person, except a native born or naturalized citizen of the United States, should be employed in any department of the State or of any county or city. Other labor laws prescribed that all men in

sawmills and logging camps should be given an hour off at noon, and that the practice of barbering should henceforth be regulated by a registering, licensing, and examining commission in order to insure more skilful work and more sanitary conditions of work.

Other Laws.—One hundred thousand dollars was appropriated to be expended by the State Board of Health, under the direction of the governor, for the prevention of the introduction of Asiatic cholera, bubonic plague, and other infectious and contagious diseases. An act of 1897, creating a commission for the promotion of uniform legislation throughout the United States, was repealed. An act of 1893, providing that all convicts, excepting those who were under sentence for murder in the first or second degree, might be paroled after having served one year, was extended by providing that all prisoners under life sentence might also be paroled after seven years, and that all others might be paroled after one year. Kidnapping was made punishable for life or for any number of years not less than ten. Two hundred and fifty thousand dollars was appropriated for the use of the University of California for the current year. An act was passed, authorizing the practice of osteopathy in the State, providing, however, that the applicant had passed an examination or met the requirements set by a State board of osteopathic examiners; said board to consist of five members graduated from a legally authorized school of osteopathy. The libel law of the State was strengthened by making it a misdemeanor to write, print, or circulate a political pamphlet intended to defeat the nomination or election of any candidate for office, unless the name of the person or political party issuing the same plainly appeared upon the circular. An act was passed, making it obligatory for the authorities of any city or town in the State when requested by one-fourth of the electors, to establish therein a public library. An act was passed creating a State board of architecture to consist of ten persons appointed from societies of architecture of recognized standing; the board was to test the fitness of candidates to be recognized architects. And in future, all those who practised architecture without a certificate issued by the board were required to make it publicly known that they were unrecognized architects.

State Officers.—Holding office in 1901 and through 1902: Governor, Henry T. Gage, Republican, elected for four years, term expires in January, 1903; lieutenant-governor, Jacob H. Neff; secretary of state, Charles F. Curry; controller, Edward P. Colgan; treasurer, Truman Reeper; attorney-general, Tiley L. Ford; surgeon-general, M. J. Wright; superintendent of education, Thomas J. Kirk; insurance commissioner, A. J. Clunie.

Supreme Court: Chief justice, term four years and until January, 1903, W. H. Beatty; associate justices, T. B. McFarland, C. H. Garoutte, R. C. Harrison, W. Van Dyke, F. W. Henshaw, and Jackson Temple—all Republican except Jackson Temple and W. Van Dyke.

Congressional Representatives (57th Congress). In the House—Frank L. Coombs, from Napa; Samuel D. Woods, from Stockton; Victor H. Metcalf, from Oakland; Julius Kahn, from San Francisco; Eugene F. Loud, from San Francisco; James McLachlan, from Pasadena, and James C. Needham, from Modesto—all Republicans. In the Senate—George C. Perkins, from Oakland, and Thomas R. Bard, from Hueneme—both Republicans.

CALIFORNIA, UNIVERSITY OF, Berkeley, Cal., funded 1868. For the collegiate year 1901-02 the teaching force is reported at about 250 and the attendance at 2,932, as follows: Academic departments, 2,261; art, 178; law, 100; medical, 150; post-graduate medical department, 11; dentistry, 141; pharmacy, 85. The percentage of women was about 45. On January 1 the medical department was fully merged into the university and its separate board of trustees discontinued. The announcement has been made that with the autumn of 1905 two years of college work will be required for entrance into its medical school. A uniform list of admission requirements for the colleges of letters, social science, and natural sciences has been adopted which will go into effect in 1906. The requirements are the same as those of Harvard. There are 116 high schools, public and private, whose graduates are qualified to enter the university without passing entrance examinations. During the past year gifts from Mrs. Phoebe A. Hearst included \$50,000 to sustain the new department of anthropology. A new department of irrigation was established, with Elwood Mead in charge. The income for the year 1901-02 was estimated at \$319,945, and represents an outlay of about \$165 per student, as compared with \$565 at Columbia, \$416 at Chicago, and \$299 at Harvard.

CAMBODIA, one of the countries comprising French Indo-China, is located on the Gulf of Siam between Cochinchina and the Kingdom of Siam. It has an estimated area of 40,530 square miles, and a population of about 1,500,000. The capital is Prom-Penh, with 50,000 inhabitants. The government is carried on in the name of the king of Cambodia, but the French resident presides at the state council, and the internal affairs are almost entirely in the hands of French officials. The budget

for 1900 was fixed at 2,315,587 piastres, including an allowance of 520,510 piastres for the civil list of the king. The chief products are cinnamon, coffee, pepper, cotton, maize, and rice. The foreign trade is carried on largely through the port of Saigon in Cochín-China (*q.v.*) with which the trade statistics are included. See **INDO-CHINA**.

CAMEROON, a German protectorate in West Africa, extending from the Bight of Biafra north-eastward to Lake Tchad. It lies between Nigeria on the north and the French Soudan and French Congo on the east and south. Its area is estimated at 191,130 square miles, and its population at 4,500,000, consisting of Bantu negroes on the coast and Soudan negroes inland. The region is not healthful for Europeans, and in 1900 there were but 528 white persons in the territory—an increase of 103, however, over the white population in 1899. Of these, 433 were Germans, 47 English, 19 Americans, 11 Swedes. Among them were 44 women, of whom 35 were Germans. Of the white population, 86 (all Germans) are connected with the administration and the army, 182 are merchants, 71 are missionaries, and 92 are planters. They are distributed among the following districts: Cameroon, 171; Edea, 33; Victoria, 200; Kribi, 108; Sanga Ngoko, 16. The protectorate is administered by an imperial governor, who is assisted by a local council. The capital town has been moved from Cameroon (re-named, in the spring of 1901, Duala) to Buea. There are government stations at Rio del Rey, Buea, Yaunde, Lolodorf, Campo, Johann Albrechtshöhe, Yoko, Sanga Ngoko, and in 1900 a new station was erected at Nssakpa, and a military station at Ebolowa. Government schools have been established at Victoria and Duala; in 1900 the first had 104 pupils and the second 97 pupils. Four missionary societies have organized schools, comprising about 5,000 pupils. The province has never been self-supporting; indeed of late, the amount supplied by Germany to balance the budget has increased. In 1898, it was 814,000 marks; in 1901, it was 2,192,000 marks. The total budget in 1901 balanced at 3,788,800 marks. (The mark is worth 23.8 cents.) The main source of income is the tax on imports, amounting in 1901 to 1,400,000 marks. The value of the imports for 1899-1900 were computed at 12,726,734 marks, and the exports at 5,156,943 marks. The little increase in exports over previous years was due to a falling off in the production of palm oil, palm-kernels, gum, and ivory; the exports of valuable woods, of cacao and of Kala nuts increased. In June, 1900, 3,056 hectares of land (one hectare = 2.471 acres) were under cultivation, 2,201 hectares being planted with cacao trees. Four new German trading houses were established in 1900, bringing up the number of German firms to 15. There are 7 English houses. Three steamship lines connect the protectorate with Europe. There are five post-offices at Duala, Victoria, Buea, Rio del Rey, and Kribi, through which, in 1899-1900, 149,794 letters passed, besides packages and 6,308 newspapers. The office at Duala is connected by cable with Bonney, in southern Nigeria. During 1901 a company was formed to build a railway from Victoria to Mundame. The negroes of the interior are turbulent, and an army of about 600 natives, officered by Germans, is maintained to keep order. In 1900 there were several uprisings, and the postmaster at Rio del Rey was killed. Von Besser, in command of an expedition, punished the guilty parties and established a station at Nssakpa. The Buli, who had attacked Kribi, were defeated, and the military station of Ebolowa was erected in their district. A rebellion among the southern tribes, the Baköë, Mangissa, Yemisse, and Bogha-Gane, was suppressed.

CAMPBELLITES, or **CAMPBELLITE BAPTISTS**, a term popularly applied to Disciples of Christ (*q.v.*).

CAMPOAMAR Y CAMPOOSORIO. **RAMÓN DE**, Spanish poet, philosopher, and statesman, died at Madrid, February 12, 1901. He was born at Navia in Asturia, September 24, 1817, and went to Madrid in 1837 to study medicine. After a short time he studied law, but after the publication of his *Poesías* (1840) devoted himself to literature. Later still he entered politics, serving as governor of Castellón, Alicante, and Valencia, and was several times a member of the Cortes, where he won distinction as an orator. He withdrew from politics after the revolution of 1868, but upon the accession of Alfonso XII. in 1875, became a councillor of state, and was chosen to the Royal Spanish Academy. As a poet de Campoamor was intensely individual and human, a psychologist in method, writing in a simple, direct style that appealed to the people. Though never deeply stirred, and deprecating the manner of the grandiloquent school of poets contemporary with his early period, he gained a firm command of poetic form; and his best work is found in his peculiar adaptations of verse forms, embodying the crisp, short, epigrammatic thought. Of these forms he has characterized the "Humoradas" as the shells of epigrams, the "Doloras" as dramatized Humoradas, and the "Pequeños Poemas" as amplified Doloras, or poems of the little. His more ambitious poems include, *El Drama Universal* (1873), an epic poem in eight cantos; *Colón* (1859), a narrative in sixteen cantos; and eight cantos of a legendary poem, *El Licenciado Torralba*. He was a philosopher of the

most modern type, touched with cynicism, but good-naturedly tolerant of that which he felt bound to criticise, and witty withal. His philosophical writings include *Filosofía de las leyes* (1846), *El Personalismo* (1850), *Polemicas con la democracia* (1862), *Lo Absoluto* (1865), and *El Idealismo* (1883).

CANADA, DOMINION OF, the largest colonial possession of Great Britain, occupying the northern part of the North American continent. The capital is Ottawa.

Area and Population.—The total area, exclusive of the territory of Franklin, whose area is unknown, is placed at 3,653,946 square miles, including 605,253 square miles of water surface. The population, census of 1891 and of 1901, is stated as follows:

Province.	1901.	1891.	Increase.
Ontario	2,182,947	2,114,321	68,626
Quebec	1,648,898	1,488,535	160,363
Nova Scotia	459,574	450,396	9,178
New Brunswick	331,120	321,263	9,857
Manitoba	254,947	152,506	102,441
British Columbia	178,657	98,173	80,484
Northwest Territories	158,940	66,799	92,141
Prince Edward Island	103,259	109,078	5,819
The Unorganized Territories	52,709	32,168	20,541
Total Population.....	5,371,051	4,833,239	537,812

The population of the largest cities in Canada, according to the census of 1901, together with the increase since 1891, is shown in the following table:

City.	Population 1901.	Increase since 1891.	City.	Population 1901.	Increase since 1891.
Montreal	266,826	46,645	London	37,983	6,006
Toronto	207,971	26,751	Vancouver	26,196	12,487
Quebec	68,834	5,744	Victoria	20,821	3,980
Ottawa	59,902	15,748	Kingston	18,043	1,220
Hamilton	52,550	3,570	Brantford	16,631	3,878
Winnipeg	42,336	16,697	Hull	13,988	2,724
Halifax	40,787	2,292	Charlottetown	12,080	707
St. John.....	40,711	1,532	Valleyfield	11,055	5,540

Thus the population of the Dominion shows an increase of 537,812, or nearly 11.13 per cent. for the decade of 1891-1901, as compared with over 11 per cent. for the decade of 1881-91, and 17 per cent. for the decade of 1871-81. These figures are certainly disappointing when the natural advantages of the country are considered, and they lose still more when compared with the increase of the population of the United States during the decade of 1890-1900. According to a statement published recently by the British Board of Trade, the emigration from Canada to the United States within the last year was estimated at 65,000 to 75,000, while the emigration from the United States to Canada amounted only to about 13,000. New York City alone, according to preliminary census figures, contains nearly 22,000 Canadians, and it is estimated that Chicago has about half as many Canadian residents. An examination of the first table given above will show that the province of Quebec has the largest absolute increase, the Northwest Territories, the largest relative increase (118 per cent.), and Prince Edward Island the only decrease. From the two tables it may be seen that the cities have increased at a faster rate than the entire Dominion—a fact that is hardly to be considered as a favorable symptom in an undeveloped country like Canada.

Government.—By a parliamentary act of 1867, authorizing and establishing the Canadian federation, Canada was virtually created an independent republic, though with a titular executive representing the English crown. This executive, the governor-general, rules by and with the consent of the privy council, but the privy council is composed of certain members of the dominant party in the Canadian Parliament, and is headed by the premier, the leader of his party and the real executive of Canada. The legislative power is vested in a federal parliament, consisting of a Senate and a House of Commons. The House of Commons consists of 213 members elected for a term of five years, and the Senate of 81 members, nominated for life by the governor-general upon the recommendation of the council. Representation in both houses is based approximately upon population and changes in both the number and distribution may be made in accordance with the findings of the census. Local self-government is provided for by provincial legislatures and by a territorial legislature, but the provincial and territorial executives are nominated by the governor-general with the advice of the privy council.

The ministry of the Liberal party, which came into power at the general elections of 1896, is at present constituted as follows: Premier and president of the council, Sir Wilfrid Laurier; secretary of state, R. W. Scott; minister of trade and commerce, Sir R. J. Cartwright; minister of justice and attorney-general, David Mills; minister of marine and fisheries, Sir L. H. Davies; minister of railways and canals, A. G. Blair; minister of militia and defense, F. W. Borden; minister of finance, W. S. Fielding; postmaster-general, W. Mulock; minister of agriculture, S. A. Fisher; minister of public works, J. I. Tarte; minister of interior, Clifford Sifton; minister of customs, William Paterson; minister of inland revenue, M. C. Bernier. Charles Fitzpatrick, solicitor-general, has no seat in the cabinet, while R. R. Dobell and J. Sutherland have cabinet positions but are without portfolios.

Finance.—The general economic prosperity of the country in 1900 is manifested both in its commerce and in its public finance. The revenue and expenditure for the fiscal year 1900 amounted to \$51,039,994 and \$42,975,280 respectively, leaving a surplus of \$8,054,714, the largest in the history of the Dominion. The increase in the revenue of \$4,298,744 over the preceding year was due largely to the increased custom receipts, which amounted in 1900 to \$28,889,110, as against \$25,734,229 in 1899. The other sources of revenue were postal receipts and internal and miscellaneous revenues. The chief items of expenditure were charges on the public debt, \$13,392,479; railways and canals, \$5,433,127; post-office, \$4,807,484; subsidies to provinces, \$4,250,608; and public works, \$2,472,748. The gross debt of the Dominion at the end of the fiscal year 1900 amounted to \$346,206,980, as against \$345,160,903 at the end of the preceding year. The assets amounted to \$80,713,173, of which \$60,572,589 were interest-bearing. The average rate of actual interest paid on the debt in 1900 was 3.09 per cent.

Agriculture.—According to official statistics the total area of land set out for settlement in the Dominion at the end of 1900 was nearly 82,000,000 acres. During 1900 there were made 7,848 homestead entries, representing 24,565 persons. According to nationality, the entries were made by 3,331 Canadians, 1,851 by immigrants from the United States (including 170 returned Canadians), 955 by immigrants from Great Britain, 50 French, 259 Germans, 1,043 Austro-Hungarians, 80 Russians, 101 Swedes and Norwegians, 71 Icelanders and 107 by immigrants from other countries. The statistics of crops are given under the separate provinces, and the agricultural importance of the Dominion, as a whole, may be judged from its exports of domestic agricultural and animal products. These exports for the fiscal year 1900 show a very considerable increase as compared with the exports for the preceding fiscal year, and were made up as follows: Wheat, 16,844,650 bushels (10,305,470 in 1899); wheat flour, 768,162 barrels; oats, 6,929,214 bushels; peas, 3,059,927 bushels; and barley, 2,156,282 bushels. The exports of live stock from the Dominion in 1900 comprised 10,053 horses, 205,524 cattle, and 459,944 sheep. The chief animal products exported during the same year, with comparisons for the previous year, were: Bacon, 132,175,688 pounds (111,868,938 pounds in 1899); hams, 2,856,186 pounds (4,783,989); beef, 2,847,180 pounds (363,810); canned meats, 2,879,897 pounds (1,110,165); butter, 25,259,737 pounds (20,139,195 pounds in 1899 and 11,253,787 pounds in 1898); eggs, 10,187,906 dozen (9,652,512); and cheese, 185,984,430 pounds (189,827,839). The total value of the exports of domestic agricultural and animal products for the fiscal year 1900 amounted to \$81,858,450, as compared with \$68,140,758 in 1899. Of the total amount, Great Britain took 85.6 per cent., and the United States, 8.62 per cent.

Mineral Production.—Next to agriculture, mining is the chief industry of the Dominion, whose importance as a mineral producing country has been increasing very rapidly. The total value of the mineral output, according to figures prepared by the Geological Survey, was \$63,775,090 for the calendar year of 1900, showing an increase of over \$14,000,000 or over 28 per cent., as compared with 1899. The output of the leading metals was as follows: Gold, \$27,916,752 (\$21,261,584 in 1899); copper, 18,919,820 pounds, valued at \$3,063,119 (15,078,475 pounds, valued at \$2,655,319 in 1899); nickel, 7,080,227 pounds, valued at \$3,227,707 (5,744,000 pounds, valued at \$2,067,840 in 1899); silver, 4,446,505 ounces, valued at \$2,730,598; lead, 63,169,821 pounds, valued at \$2,760,521 (21,862,436 pounds, valued at \$977,250 in 1899). The chief non-metallic minerals were coal, 5,332,197 short tons, valued at \$12,668,475; coke, 157,134 tons; and petroleum 710,498 barrels, valued at \$1,151,007. Out of a total consumption of 167,169 short tons of pig iron in 1900, about 61 per cent. was produced in the Dominion (including over 40 per cent. made from foreign ore). The exports of domestic mineral products in 1900 amounted to \$26,116,077 (\$14,143,149 in 1899). The United States took \$24,355,843, against \$12,913,311 in 1899. In 1901 there were in Canada 7 iron works in operation, with an annual capacity of 440,000 tons. There was also being constructed by the Lake Superior Power Company an extensive plant for the manufacturing of pig iron, steel, and steel rails at Sault Ste. Marie, Ont., which will be the first establishment for the manufacturing of steel rails in the Dominion.

Fisheries.—The yield of the Dominion fisheries for the calendar year 1899 (the latest for which official statistics are available) shows an increase over the preceding year, although it still falls short of the yield of 1897. The total value for 1899 was \$21,891,706, as compared with \$19,667,126 for 1898 and \$22,783,546 for 1897. The chief kinds of fish caught during 1899 were: Cod, \$3,738,223; lobsters, \$2,870,000; salmon, over \$4,000,000; and herring, over \$2,000,000. Nearly 80,000 men were employed in the fishery industry, and the value of the plants (excluding lobster canneries) was over \$10,000,000. The bounties paid to fishermen by the government, under the act of 1882, amounted in 1899 to \$160,000, making the total amount paid, since the passing of the act, \$2,841,369. The sealing industry for 1900 shows only a slight improvement over the preceding year, the catch for the two years being 35,523 and 35,346 respectively. The exports of the products of the Canadian fisheries for 1900 was the largest in the history of the Dominion, amounting to \$11,169,083 against \$9,909,662 in the preceding year.

Commerce.—The official figures for the trade of the Dominion for the fiscal year 1900 are of the most encouraging nature. The aggregate value of the imports and exports for that year was the largest in the history of the country, exceeding the total commerce of the preceding year by over \$60,000,000 (\$381,517,236 against \$321,661,213). The imports amounted to \$189,622,513 (\$162,764,308 in 1899), of which \$180,804,316 represented imports for home consumption. Of the latter, the United States contributed \$109,844,378 (\$93,844,378 in 1899); Great Britain, \$44,789,730 (\$37,060,123 in 1899); and other countries, \$26,170,208 (\$23,984,304 in 1899). During the last decade of the 19th century the proportion of imports from the United States, in the total imports for home consumption, to the Dominion increased from 46.37 to 60.75 per cent., while the imports from Great Britain during the same period decreased from 38.48 to 24.77 per cent., notwithstanding the advantages of the preferential tariff, which has been in force since 1898. The imports for 1900, with comparative figures for the preceding year, were made up as follows: Articles of food and animals, \$30,008,980 (\$29,011,195); crude products used in domestic industries, \$33,351,292 (\$29,241,888); articles wholly or partially manufactured used in domestic manufactures and mechanical arts, \$35,679,437 (\$26,116,487); manufactured articles ready for consumption, \$60,838,204 (\$53,132,914); articles of voluntary use, luxuries, etc., \$12,628,965 (\$11,843,975). The total value of the imports under preferential tariff was \$24,954,262 in 1898, \$26,597,442 in 1899, and \$27,095,791 in 1900. The value of the domestic exports in 1900 was \$170,642,369 (\$138,462,037 in 1899), of which \$96,562,875 went to Great Britain, \$59,666,556 to the United States and \$14,412,938 to other countries. Thus the exports to Great Britain decreased for the year from 61.47 to 56.59 per cent. of the total, while those to the United States increased from 29.30 to 34.97 per cent. Taking, however, the entire last decade of the 19th century, the exports to Great Britain show an increase from 48.67 to 56.59 per cent., while those to the United States show a decrease from 42.48 to 34.97 per cent. The domestic exports for 1900 were made up as follows: Mineral products, \$24,575,155 (\$13,365,442 in 1899); fishery products, \$11,169,083 (\$9,909,662); forest products, \$4,495,789 (\$5,486,724 in 1899); animals and animal products, \$56,148,809 (\$46,743,130); agricultural products, \$27,516,609 (\$22,952,915 in 1899); and manufactures, \$39,397,277 (\$34,244,220). Preliminary figures for the fiscal year 1901 give the aggregate value of the trade of the Dominion as \$394,000,000. The number of failures for 1901 was 1,341 (1,355 in 1899), with liabilities amounting to \$10,811,671, and assets of \$7,686,823. See the foregoing paragraphs on Agriculture, Mineral Production, and Fisheries.

Currency and Banking.—The average monthly note circulation in the Dominion during 1900 was \$26,550,465, as against \$25,041,650 in 1899 and \$23,229,779 in 1898. The aggregate paid-up capital of the Dominion banks at the end of the calendar year 1900 amounted to \$65,154,594 (\$63,726,399 in 1899), and the notes in circulation, \$46,574,780 (\$41,513,139 in 1899). The clearings at the clearing-houses of Montreal, Halifax, Toronto, Hamilton, Winnipeg, St. John, Victoria, and Vancouver amounted to \$1,589,560,411 (\$1,625,680,194 in 1899), of which over 46 per cent. was transacted at the clearing house of Montreal, and over 32 per cent. at that of Toronto. Deposits in the government savings banks, which are under the supervision of the Department of Finance, are being gradually transferred to the post office savings banks. The number of the latter at the end of the fiscal year 1900 was 847 (838 in 1899), with 150,987 depositors and deposits amounting to \$37,507,456, or \$248.41 per depositor. The 24 government savings banks had at the same date 45,773 depositors and deposits amounting to \$15,642,267, or \$341.74 per depositor.

Shipping and Communication.—The registered shipping of Canada, including vessels for inland navigation, comprised at the end of the calendar year 1899 1,942 steamers, with a net tonnage of 157,185; and 4,631 sailing vessels, with a net tonnage of 499,552. In 1899, 13,909 sea-going vessels entered at Canadian ports, and 13,212 cleared; the tonnage was 6,733,151 and 6,503,903 respectively. Of

the total number of vessels entered, 5,537, with a tonnage of 921,184, were Canadian; 2,563, with a tonnage of 2,248,311, were British; and 5,809, with a tonnage of 2,325,656 were foreign. The coasting navigation during the same year amounted to nearly 16,000,000 tons, almost exclusively in British and Canadian vessels. The water-ways of the Dominion have a total length of over 2,700 miles. The traffic through the canals in 1899 amounted to 7,594,304 tons; and the tolls to \$276,658, as compared with \$325,149 in the preceding year. Of the total tonnage, 4,308,571 tons were divided between 23,579 Canadian steamers and sailing vessels; and 3,285,733 tons between 6,101 United States steamers and sailing vessels. The railway lines of the Dominion in operation had, at the end of the fiscal year 1900, a total length of 17,657 miles, as compared with 17,358 miles at the end of the preceding year. The train mileage increased from 52,215,207 in 1899, to 55,177,871 in 1900; the number of passengers from 19,133,365 to 21,500,175; the freights, from 31,211,753 tons to 35,946,183 tons. The earnings for 1900 amounted to \$70,740,270 (\$62,243,784 in 1899), or \$4.006 per train mile; and the working expenses to \$47,699,798 (\$40,706,217 in 1899), or \$2.701 per train mile. The private companies, with 16,146 miles of road in operation, had at the end of 1900 a paid-up capital of \$933,632,205; the government railways, with a mileage of 1,511, had a paid-up capital of \$64,636,200. The proportion of expense to receipts on the private lines during 1900 was 65.21 per cent.; while the government lines show a percentage of 98.42. The total amount paid out by the Dominion government in railway subsidies from 1883 to the end of the fiscal year 1900 was \$20,200,312. The telegraph lines of Canada had at the end of 1900 a total length of 34,623 miles, of which 3,906 miles (including 240 miles of cable) were owned by the government. The private lines belong to the Great Northwestern Telegraph Company, the Canadian Pacific Railway Company, and the Western Union Telegraph Company. The number of post offices at the end of the fiscal year 1900 was 9,627. The postal revenue and expenditures for the same year amounted to \$4,345,823, and \$4,807,484 respectively; while the amount of mail subsidies paid out by the department of trade and commerce for the year was \$599,832.

Education.—Public instruction in Canada is entirely under the control of the separate provinces. The number of public schools for the entire Dominion in 1900 was 17,989, with an enrollment of 945,088. Of other schools there were 974, with a total enrollment of 143,064. The revenue from all the schools was \$9,985,226, of which the government contributed \$1,251,611. The expenditures amounted to \$9,461,496. Canada has 17 degree-conferring institutions, and about 25 colleges. The libraries number 535, of which 380 are public, and 418 are situated in the province of Ontario. The total number of volumes is 1,972,056, and of pamphlets, 122,746.

HISTORY.

Political Parties.—In Canada, as in Great Britain, Conservatives and Liberals constitute the chief political parties. The Conservatives, it may be noted, prefer to be called Liberal-Conservatives. With the exception of one interval of five years, the Conservatives were in power from the establishment of the Dominion in 1867 until 1896. In the general elections of the latter year the Liberals, under Sir Wilfrid Laurier, were placed in power by large majorities, notwithstanding that the united Catholic influence was on the side of the Conservatives. There were returned to the House of Commons 118 Liberals, 86 Conservatives, and 8 independents of Liberal leanings. The general elections of 1900 resulted as follows: Liberals, 125; Conservatives, 78; independents, 10. Sir Wilfrid Laurier, as premier, continued in power. Mr. R. L. Borden, senior member for Halifax, was unanimously chosen as Conservative leader in succession to Sir Charles Tupper, who, rejected by Cape Breton in the last election, retired from public life in his eightieth year on score of age, refusing offers of constituencies from every province. Mr. Louis Philippe Brodeur was elected speaker of the House.

The census returns of 1901 will effect a change in the next decennial distribution of seats, the unit of representation in the House of Commons being based on the population of Quebec, whose representation is fixed at 65 members. Manitoba, in consequence, will gain 3 members, the Northwest Territories and British Columbia 2 each, while Nova Scotia will lose 2 and New Brunswick and Prince Edward Island 1 each.

Parliamentary Session.—Lord Minto, the governor-general, opened the ninth Parliament of the Dominion on February 7, 1901, the members having assembled the day previous to take the oath of allegiance to the new King. In his speech, Lord Minto referred to the marvelous progress made in the mining and agricultural regions of western Canada, to the great improvements effected in the navigation of the St. Lawrence by the widening and deepening of the channel between Quebec and Montreal, and to various other matters connected with the Dominion's development. The chief business of the session included the following: The appointment of a railway commission, intrusted with plenary powers to enforce

the provisions of the Railway Act, especially to prevent a recurrence of discrimination in railway freight rates injurious to agricultural interests in the western parts of the Dominion; the establishment of a branch of the Royal Mint to coin Yukon and British Columbia gold into Dominion currency as required, and the balance into English sovereigns (previously there had been no Canadian gold coinage); the installation of the Marconi wireless telegraphy system in the Gulf of St. Lawrence, with a preliminary station at Anticosti; the connection by cable of Belle Isle with the joint line to Quebec; and the voting of an annual subsidy of \$100,000 for a direct steamship line between Canada and France, half the vessels to be under the British and half under the French flags, so that subsidies would be earned from both countries. Tenders were also invited by the Dominion government for a service of fast steamships between Canada and England. It was estimated that with vessels of 21 knots an hour the passage could be made in less than four days between Queenstown, Ireland, and Sydney, Cape Breton, the suggested terminals. The Montreal Board of Trade asked for the appointment of a Royal Commission to investigate the alleged discrimination against the St. Lawrence route by English marine insurance underwriters, and also advocated the establishment of a Canadian Lloyds Maritime Insurance Association.

Imperial Relations.—The death of Queen Victoria and the accession of King Edward VII. were marked with the customary solemnities and ceremonies. The Dominion Parliament decreed that May 24, the Queen's birthday, should be known as Victoria Day and be kept as a holiday for all time. The Dominion's memorial takes the form of a Victoria National Museum in Ottawa, to cost \$1,000,000. In September, 1901, the visit and tour of the Duke of Cornwall, heir apparent to the throne (who became Prince of Wales on November 9, 1901), accompanied by the Duchess of Cornwall evoked in Canada enthusiastic expressions of loyalty, though the brilliant proceedings were tinged with the sadness occasioned by the assassination of President McKinley. The day of the President's funeral was marked by a suspension of the spectacular parts of the programme attending the royal visit. Throughout the Dominion generally, and at Ottawa in particular, the maintenance of imperial unity and of loyalty to the mother country was manifested in the continued support accorded to the prosecution of the Boer war, especially in the numerous enlistments for the South African constabulary. The question of colonial representation in the Imperial House of Lords and on the judicial committee of the privy council, as tending to increase the efficiency of the tribunal and make it more popular as a court of final resort from the colonies, received the cordial support of the Anglo-Canadian legal fraternity. On the other hand, the question of national independence as the principal plank of a Parliamentary party, was prominently urged by French lawyers and Liberal members, who believe that an independent commonwealth secured by constitutional means would progress more rapidly, although the *status quo* is to be preferred to annexation to the United States. Early in 1901 the relations between Great Britain and Canada were succinctly defined in a speech at Toronto by Sir Wilfrid Laurier, the premier, who said: "Canada, while still a colony, is practically an independent nation, and the result of the present system has been to lead to thoughts of closer union than ever before. While no one supposes that the present relations with Great Britain are to last, they are satisfactory at the present day, and when in the course of the future new problems shall arise, they will be faced and solved on the strictest lines of Canadian nationality and British citizenship." The visit in November, 1901, of the Irish Nationalist delegates, during their American tour, was interesting as a phase of the question of imperial unity. The delegates, Mr. J. Redmond, M. P., Mr. P. A. McHugh, M. P., and Mr. O'Donnell, M. P., received a cordial welcome at Ottawa by a large audience, which included the three ministers of state, Sir Wilfrid Laurier, Mr. Scott, and Mr. Sifton. Mr. Redmond, in a moderate speech, held that the Canadian example of home rule afforded the strongest possible argument in favor of the concession of the Irish demand, and broadly hinted that another expression by the Canadian Parliament in favor of Irish home rule would be acceptable. He justified the use of physical force, if necessary, but declared that his party relied on constitutional measures to secure responsible government for Ireland. The question of national and imperial defense received its due share of agitation, and the burden of the defense and maintenance of the chief Canadian stations and border posts were strongly urged by voice and press, of Anglo-Saxon tendencies, upon the Canadian government as a natural sequence to the growth and prosperity of the Dominion.

In the British Parliament the budget proposals of the Dominion government came into prominence over the statement that the minister of finance maintained the preference of 33 1-3 per cent. granted on British imports, even when the colonies were freed from the restraining foreign treaties of 1862 and 1865, and information was desired whether any reciprocal arrangement on the part of England was to be made concerning Canadian goods. A reply was elicited that while the action of

Canada was confined to the reduction of high duties in favor of England, reciprocity on the part of England would involve the imposition of duties on imports from other countries for the benefit of Canada, a proceeding which the Dominion scarcely expected. Appreciation of the Dominion's spirit had been shown in the aid given both in the steamship service between Canada and Japan, and towards the Pacific cable (*q.v.*), which was in course of construction.

Internal Events.—A strike of wool workers took place in 1901 because of a reduction of wages, caused by the employers' inability to compete with British goods under the preferential tariff. Other strikes included one of 74 days among railway workers on the Canadian Pacific Railway, and another at Ottawa, among carpenters, tinsmiths, machinists, and woodworkers, to obtain higher wages, shorter hours, and recognition of unions. In a strike of ship laborers at Quebec for a ten-hour day at twenty-five cents an hour, the strikers were brought to terms by the uninterrupted prosecution of the work by non-union men. A strike at the Grand-mère pulp mills was abruptly terminated by the realization of the strikers that they were the victims of a misunderstanding regarding the readjustment of the pay system. A great fire at Montreal in January, 1901, devastated four acres in the centre of the whole-sale business section, the Board of Trade building being the chief loss. The total damage was estimated at \$4,000,000. In the early part of April disastrous floods occurred in the eastern provinces of Quebec and Ontario. During November, also, rumors were rife of a conspiracy for the overthrow of Canadian rule in the northwest and the establishment of an independent republic. The conspiracy ended, it is said, owing to the publication of the secrets of the "Order of the Midnight Sun," an organization which had for its purpose the instigation of a rebellion in Dawson. Yukon officials were in communication with the Ottawa administration and stated that arms and ammunition were secreted in great quantities, and that serious trouble might ensue.

Religious Questions.—The Laurier government in deference to mixed religious opinion did not accord state recognition to the services in memory of Queen Victoria, held in the Anglican Cathedral at Ottawa, lest such action should be misconstrued into an acknowledgment of a Canadian state church. The organized action among British Roman Catholics against King Edward's accession oath extended to Canada, where a petition was circulated through the city and province of Quebec demanding the abolition of "this vestige of hate and discord which tend to alienate the loyalty of a great many of his Majesty's subjects." A dignified debate in the Dominion Parliament resulted in the adoption of a resolution to memorialize King Edward to amend the coronation oath by eliminating therefrom all those expressions which are especially offensive to the religious beliefs of any subject of the British crown. In Manitoba (*q.v.*) the long-enduring troubles of the Roman Catholic schools were settled, but the perennial question of religious liberty came into notorious prominence over the Delpit marriage case.

The Delpit Marriage Case.—Mr. Delpit, a private secretary of Mr. Jetté, lieutenant-governor of Quebec, in May, 1893, married a Miss Cote, a Unitarian minister officiating. Three children were born of the union, and the contracting parties lived together until the husband invoked the powers of the ecclesiastical court of the province for an annulment of the marriage on the ground that, husband and wife being Roman Catholics, the ceremony was invalidated by the fact of its having been performed by a Protestant minister, who according to the Catholic church was not a competent officer. The ecclesiastical tribunal granted the plaintiff's request, which he sought to have confirmed by the civil court. The wife vigorously contested the action, among other allegations contending that at the time of the marriage she was a recognized Protestant; that Mr. Delpit had declared himself a non-Catholic; that a Unitarian minister was a competent officer to perform the ceremony, even if both the parties had been Roman Catholics; that the ecclesiastical court had no jurisdiction to inquire into the validity of the marriage; that she had contracted the marriage in good faith, relying on the plaintiff's declarations, and believing she was marrying before a competent officer, and that since the solemnization of the marriage up to the plaintiff's application to the ecclesiastical tribunal, the defendant had always been publicly recognized in the civil status of a legitimate wife. The judge in an exhaustive treatment of the history of the marriage law in Great Britain and in Canada before and after the confederation cited the statute of George II., which he stated had been a great victory for religious liberty, not only between Roman Catholics and Protestants, but also between Anglicans and other denominationalists. There was no doubt whatever that ministers of every denomination were authorized to solemnize marriage. They were authorized to keep registers in the province of Quebec, and if they were legally permitted to keep them they were assuredly entitled to use them. The power of the civil law was superior to any canonic law and the husband's action was dismissed with costs. Mr. Delpit made formal application for an appeal to a higher court. His contention

was upheld and emphasized a few days later by a powerful apostolic epistle to the faithful from the Roman Catholic archbishop of Montreal.

International Relations.—The seizure of the American barge *Ajax*, belonging to a Seattle firm, for a violation of the Canadian laws, in proceeding to Canadian waters to raise the wrecked steamer *Willamette*, was referred by the United States government to the British embassy on a complaint made by Mr. Gage, secretary of the treasury. The question hinged on the interpretation of the word "contiguous" in the agreement between the United States and Canada, which permits citizens of either country to conduct such operations in contiguous waters. The Montreal Corn Exchange passed a resolution for the adoption of retaliatory measures against German goods, after receiving information from the Dominion government that no attention had been paid to the remonstrances sent through the colonial office against the prohibitions on Canadian goods in German ports, and on the statement of the imperial government that no treaty was likely to be concluded for some time. International amenities were evinced by the interest aroused in the arrival at Montreal from Chicago of the first of the ocean-going grain-laden steamers, built for the purpose of direct communication between Chicago and European ports, the journey between Chicago and Hamburg to occupy twenty days.

CANALS. The canal work of 1901 was confined almost entirely to projects for the future; in neither America nor Europe was there much actual construction. Such of these projected enterprises as seem to command most attention are briefly summarized in the following paragraphs.

American Enterprises.—In the United States but little was heard during 1901 of the project for a deep waterway from the Great Lakes to the Atlantic Ocean, the active promotion of this scheme seeming to have been dropped after the preliminary report of the Board of Deep Waterway Engineers in 1900. In respect to the New York State canals improvement, which has occupied public attention for several years, the only new development of 1901 was the report of State Engineer Bond on the surveys of 1900. Briefly summarized, the New York legislature in 1900 appropriated the sum of \$200,000 to be expended by the State engineer in making surveys and estimates for a canal from Lake Erie to the Hudson River, large enough to accommodate boats of 150 feet length, 25 feet beam and 10 feet draft, with a cargo capacity of 1,000 tons. These surveys were made during 1900, and the report of their results was submitted to the governor on February 12, 1901. As this report represents the latest technical developments of the attempt of the people of New York State to place their canal system on a paying basis, it is given quite fully in abstract in a separate article. The report of the Isthmian Canal Commission in 1900 registered the latest technical developments of the various enterprises for a canal across Central America; the work of 1901 was almost wholly legislative work, with almost no definite results to make public at the end of the year. Turning now to the progress of canals which came up during 1901, the first thing of note which appears in this year's record was the report of the Board of Engineers of the United States Army in January recommending that no further consideration be given to the proposed 14 feet waterway from Lake Michigan to the Gulf of Mexico, by the way of the Des Plaines, Illinois and Mississippi rivers, since the 8 feet channel already provided for was ample to meet all the reasonable demands of traffic. During the year surveys were made under a \$10,000 appropriation act of the Massachusetts legislature for a canal across Cape Cod, but no report was made of the results. The Lake St. Clair-Lake Erie canal project was also revived during the year. This project calls for a canal $13\frac{1}{2}$ miles long through low-lying land, with the underlying rock more than 20 feet below the bottom of the deepest cut. A uniform depth of 21 feet is proposed, with a canal 156 feet wide on the surface and 72 feet wide on the bottom. This canal would enable vessels to avoid the fogs, shoals, and rapid current of the Detroit River, and would afford a straight course from the St. Clair flats canal, through Lake St. Clair to Lake Erie. The course would be unimpeded by locks, and a speed of 6 miles an hour could be maintained. The saving in distance by the canal would be 79 miles, between the foot of the St. Clair flats canal and an offing in Lake Erie. In time the saving would be six or seven hours. No estimate of cost is given, but the promoters of the canal claim that there would be a net saving of \$1,000,000 per year on the 40,000,000 tons of freight now annually passing through the Detroit River.

Foreign Enterprises.—In January, 1901, a canal improvement bill was before the Prussian Diet, calling for expenditures as follows: Midland canal, \$65,000,000; Berlin-Stettin canal, \$10,250,000; Oder tidewater canal, \$10,250,000; Havel-Spree canal, \$4,750,000. During the year the Neusil Saar canal also received attention from the German authorities. The Mosel rises in France and empties into the Rhine at Coblenz, after following a winding course of 319 miles. At its source the stream is 2,411 feet above sea level, and at its mouth it is 198 feet above this level. The proposed canal would be about 200 miles long and overcome a difference in

level of 340 feet by the construction of 42 needle dams. Including the expense of straightening about 40 miles of the River Saar, the estimated cost is \$18,000,000. In Hungary the Danube-Theiss and the Danube-Save canals were among the projected public works of 1901. The main branch of the proposed Danube-Theiss canal would connect Budapest with Osongrad, and be about 93 miles long, with a branch about 42 miles long from Felegyhaza to Szegedin. The proposed Danube-Save canal would run from Vukovar, on the Danube, to Saurac, on the Save, a distance of 35.6 miles. According to the United States consular reports the Hungarian ministry of commerce was also considering an Adriatic-Baltic water route. The route proposed contemplated joining the Oder and Danube by canal. It would start from Fiume, a seaport on the Adriatic; go up the River Kulpa and down the Save; then by an existing canal to the Danube; up the Danube to the province of Moravia, where a canal would be built to the Oder through a connecting valley; and then down the Oder to Stettin on the Baltic. In Russian territory, the record of the year included a canal connecting the Black and Caspian seas. The canal proposed would extend from Taganrog on the Sea of Azov to Astrakhan on the Caspian, by the way of the Volga. The proposed dimensions are: Width, 84 feet; depth, 22 feet; length, 530 miles. Another proposed Russian canal was the St. Petersburg-White Sea ship canal, 597 miles long, 200 feet wide and 31 feet deep. The route proposed is as follows: From the River Neva, across Lake Ladoga to the River Svir, and down this stream to Lake Onega; then due north through a dug canal to Seg Lake, and by canal to Vigozero Lake, and thence to the Gulf of Onega and the White Sea. During this year the Austrian government adopted a plan of canal improvements which contemplates the expenditure of over \$120,000,000 in 20 years' time on about 1,000 miles of canal. See AUSTRIA-HUNGARY, GERMANY, RUSSIA, and NICARAGUA CANAL.

CANALS IN NEW YORK STATE. The first step in the development of the present State canal system of New York was taken in 1788, when Elkanah Watson proposed improving the natural channels by way of the Mohawk River to Wood Creek, and thence through Oneida Lake to the Oswego River and to Lake Ontario. By 1796 this project was so far carried out as to afford navigation, for boats carrying 16 tons, from Schenectady westward 184 miles. The second advance was in 1808, when Simeon De Witt made a survey from the Hudson to Lake Erie, resulting in the passing of the canal law of 1816, which authorized the construction of the Erie and Champlain canals. These canals were commenced in 1817 and completed in 1825, the Lake Ontario-Oswego section being built in 1825-28. The waterway then constructed was 28 feet wide at the bottom, 40 feet wide at the surface and 4 feet deep; the locks were 90 feet long by 12 feet wide. The Champlain canal, however, was only 20 and 30 feet wide and 3 feet deep, with locks 75 x 10 feet. The third step was taken in 1835, when it was ordered that the Erie and Oswego canals should be enlarged to 52½ feet wide at the bottom, 70 feet wide at the surface, and 7 feet deep. The locks were made 110 feet long by 18 feet wide, allowing the passage of boats carrying 250 tons. This work was completed in 1862. The fourth step was suggested in 1878, when the State engineer proposed further enlargement on what has since been known as the Seymour plan; the chief object being to increase the depth to 8 feet by raising the banks or lowering the bottom as conditions might warrant. This step was further advanced in 1895, when the people of the State voted \$9,000,000 to increase the depth to 9 feet, in the waterway and 8 feet in the locks and aqueducts. This was the Seymour-Adams plan of 1895. The fifth stage of development is now begun by surveys and estimates made for a large canal, whose results were reported in 1901 and are outlined further on. At the same time the United States Deep Waterway Commission has prepared a report and estimates for a 21-foot and 30-foot ship canal through the State, at a cost of \$485,000 for surveys, etc. In March, 1899, Governor Roosevelt appointed an expert committee to advise as to the policy which the State should pursue towards its canals. This committee, on January 15, 1900, made a report recommending a barge canal, capable of passing boats 150 feet long, 25 feet wide, 10 feet draft and carrying 1,000 tons. The estimated cost of carrying out this project was \$62,000,000. The legislature adopted this report, and on April 12, 1900, it passed a law calling upon the State engineer for new surveys of specified portions of the route; and for plans and estimates for a barge canal having not less than 12 feet depth in the waterway, 11 feet in the locks and aqueducts, with locks not less than 310 feet long and 28 feet wide, with a capacity for passing the type of boat recommended by the committee of 1899. This survey is completed, \$200,000 having been appropriated for that purpose, and the report of the State engineer upon it was placed before the legislature in February, 1901. The findings of this report may be summarized as follows.

Lift Locks.—The ascent of the canal around the falls of the Mohawk River at Cohoes has been one of the most difficult problems to solve. State Engineer Adams

in 1894 advocated a mechanical lift lock at Cohoes and other localities on the Erie Canal, notably Lockport. Although mechanical lift locks of various types are in more or less successful operation in Europe, none have a lift exceeding 60 feet, while that necessary to overcome the falls at Cohoes would be 121.3 feet. Plans for such a mechanical lift lock at Lockport were made and submitted by Chauncey M. Dutton and adopted by the Canal Board, June 24, 1897. The failure of the \$9,000,000 appropriation to complete the contemplated improvement, however, stopped all progress on that work and the contract for the lock was never awarded. While the successful accomplishment of a mechanical lift at this spot is a very alluring proposition, considering what a saving of water would result, on the other hand failure of the machinery, which would involve closing the entire canal, would be a serious matter. State Engineer Bond, therefore, invited other engineers to submit plans. A hydraulic lock was proposed by the Buffalo Engineering Company, and one operated by electricity was submitted by Mr. Wm. R. Davis, chief bridge designer of the State engineer's office. For the purpose of comparison of cost, plans were also prepared for a series of concrete masonry locks which would overcome the height of the fall by a flight of four locks, each having 30.3 feet lift. These various designs were then submitted to a board of advisory engineers, consisting of Hon. Elnathan Sweet, ex-State engineer and surveyor, who was made chairman; George S. Morison and Professor William H. Burr, members of the Isthmian Canal Commission; Major Thos. W. Symons and Major Dan C. Kingman, of the Corps of Engineers, U. S. A. After carefully considering various types of mechanical lift locks and a comparison of the cost of the ordinary masonry locks, it was decided that a conservative policy demanded the use of the old and tried type rather than a comparatively new and experimental one. This decision was reached partially from the fact that timber gates of the miter type, built of solid beams of Pacific coast fir timber, have been found by practical experience on the Canadian canals to admit of the building of locks of 40 to 50 feet lift, when thought desirable. This type of gate has been in successful operation in Canada for many years, and there is nothing of the nature of an experiment in the adoption of such design. The highest lift used in the plan adopted by the board, however, is 40 feet, on the Lewiston-LaSalle line; on the Waterford line 33 feet is the highest lift. Later this same Advisory Board, with Mr. Alfred Noble substituted for Major Kingman, passed on other important details in connection with the project.

General Type of Canal.—The dimensions of the boats to be accommodated were named in the law, and it was decided that these could be met by a prism 75 feet wide on the bottom with slide slopes of 1 on 2 in earth section, and corresponding size in rock section, giving a ratio of prism to loaded boat of 4.75. In the river and lake channels the minimum width is 200 feet. Both the bottom and sides of the canal are to be thoroughly puddled wherever necessary; all embankments have a thick paddle core, all sloping sides are provided with well-constructed wash walls and all vertical walls are made of masonry. Guard locks are provided wherever required, and in the canal sections guard gates are provided at distances apart not exceeding ten miles, so that any section can be shut off for repairs whenever necessary. The single locks are 328 feet long between hollow quoins, 28 feet wide in the clear, and for lifts over 8 feet are fed through a culvert running parallel to the axis of the lock in the lower part of each wall. Smaller feed pipes discharge from these culverts into the lock and are placed from 15 to 20 feet apart. The opening and shutting of these culverts for filling and emptying is controlled by a valve operated by electricity. In the flight of locks, all of which are double, the culverts will be controlled by Fontaine lift valves, except the outlet of the lowest one, which will be controlled by a gate of the Stoney type. As a general thing, where enough fall can be obtained the power to operate all machinery will be electricity. This will also be applied to the opening and shutting of the gates, the lighting of the lock at night, and all other work incident to lockage. All boats are to be propelled by mechanical power and no towpath is provided. Throughout the canal a full complement of first-class new bridges was provided, and ample provision was made for a water supply sufficient to accommodate a traffic of 10,000,000 tons per annum.

Comparison of Routes.—The law also provided that comparative estimates should be made of the cost of various alternative routes, while separate estimates should be made of the cost of deepening the Oswego Canal to 9 feet and the Champlain Canal to 7 feet. Very extensive surveys and investigations have been made in accordance with this requirement, the most notable being the proposal to go via the Oswego River to Lake Ontario and thence through a short canal to Lake Erie, the proposal to make a slack water navigation in the Mohawk River and the diversion of the canal from the city of Rochester. A large part of the report is taken up with the comparison of the different routes; but the State engineer makes no recommendations, preferring to present such facts as will enable the State officials to judge for themselves. It is entirely plain, however, that it is vastly better to make

a system of slack-water navigation along the Mohawk and Seneca and Oswego rivers rather than attempt to enlarge the canal on its present location to the dimensions stated above. The advantage of the canalized river location is seen in the comparative estimate of cost given in the accompanying table. A still more important change is the proposal to use Lake Ontario as a part of the waterway, and it is found that by this means the cost of the work can be brought even below the estimate made by the Roosevelt advisory committee in 1899. The minimum cost of the proposed barge canal by this route is about \$50,000,000, not including the cost of the Champlain Canal improvement. A common objection to every proposition to make use of Lake Ontario is that time would be lost in locking boats down to that level and then locking them up to the height of Lake Erie. To investigate this, careful calculations were made by Hon. Elnathan Sweet, M. Am. Soc. C.E., and it was found that a round trip between Troy and Buffalo would take 35 to 40 hours less via the Lake route than via the Erie Canal route. In addition to this the maintenance will be much less on this route, as the total length of artificial canal and canalized river is much less. Against this is to be offset the necessity for using more seaworthy barges to make the lake trip than would be necessary on inland waters. If, however, the idea of Major Symons, the originator of the barge canal scheme, is realized, the canal would be chiefly used by vessels built to navigate either on the canal or the lakes, and so avoiding transfer charges at Buffalo. If this is correct, the inclusion of Lake Ontario would be no disadvantage.

Estimates for Completing the 9-Foot Deepening of the Erie Canal.—On the submission of the above report to Governor Odell, the State engineer was asked in addition to present estimates of the cost of completing the so-called \$9,000,000 improvement of the Erie Canal, authorized in 1895. Time was, of course, too brief to make new complete surveys and estimates before the adjournment of the legislature, and therefore use was made of the estimates made near the close of State Engineer Adams's term of office, by the engineers then in charge of the work of construction. To these figures additions have been made for the advance in the price of the materials for the added cost of labor due to the 8-hour law, and for the deterioration that has taken place in the canal during the years since the above estimates were made. On this basis it is estimated that the total present cost of completing the "nine million dollar improvement" on the Erie, Oswego, and Champlain canals will be \$19,797,828; and as the State engineer well says, when this amount of money has been expended the State will have on its hands "an old canal, repaired," whereas the estimates for the barge canal work are for "a modern canal, built according to the latest practice and of the highest standard known to modern engineering."

Estimated Cost of 1,000-ton Barge Canal from the Hudson River to Lake Erie (including 20 per cent. for Portions Done in Winter, assuming Present Canal will not be in Use from November 1 to June 1 During Construction).

CANALS.	Routes.	Mohawk-Seneca River.	Mohawk-Oswego River.		Present canal route modified.
			A—Via Olcott.	B—Via Lewiston.	
	Distance, Troy to Buffalo, miles.....	342.66	338.66	347.67	347.66
Erie.....	Troy to Buffalo, via Mohawk River, canalized.....	\$72,264,826			
	Via present route, modified.....				\$81,578,864
	Via Mohawk River to Three River Point, inclusive, Syracuse harbor.....		\$46,765,755	\$48,984,220	
Oswego.....	Three Rivers Point to Oswego, 12-ft canal.....		5,170,129	5,170,129	
	Three River Point to Oswego, 9-ft canal.....	1,481,012			1,481,012
Champlain.....	Troy to Whitehall, via Hudson River.....	4,750,608	4,750,608	4,750,608	
	Troy to Whitehall, via present canal.....				5,787,929
Total cost of Erie, Oswego and Champlain canals..		\$78,496,446	\$56,686,492	\$58,904,967	\$88,847,796
Estimated value of abandoned land to be deducted:					
	On Erie Canal.....	1,941,380	1,953,202	1,953,202	1,530,225
	On Oswego Canal.....		2,391	2,391	
	Champlain Canal.....	22,620	22,620	22,620	
Total cost of three canals, less abandoned lands.....		\$76,532,446	\$54,708,279	\$56,926,744	\$87,317,570

*(Exclusive of Oswego Canal) Oswego to Buffalo.

CANARIES, or CANARY ISLANDS, a group of islands off the northwest coast of Africa, constituting a province of Spain, have an area of 2,808 square miles

and a population, according to the census of 1897, of 334,521. The principal products are potatoes, bananas, and tomatoes. The seat of government is Santa Cruz, in Teneriffe, but Las Palmas, in Grand Canary, has become the leading town of the islands. In March, 1901, an electric metre-gauge tramway was opened in Teneriffe, connecting the port of Santa Cruz with La Laguna, 5.6 miles distant. It is expected that the road will be prolonged to Orotava, about 21 miles beyond La Laguna. An electric tramway is projected to join the ports of Luz and Las Palmas in Grand Canary.

CANCER. Following Roswell Park, of Buffalo, N. Y., who claimed in 1900 that cancer is increasing rapidly in the United States, statisticians in different parts of the world reported in 1901 similar conditions in their own countries. The provincial board of health of Ontario, Canada, reports that the number of deaths from cancer in the province increased from 440 in 1886 to 1,041 in 1899. It is reported that in Moscow the number of cases of cancer had doubled since 1880, and Heymann states that the mortality from carcinoma in Russia is four times as great as in 1877. Professor Lewshin, of Moscow, has collected about \$150,000 for the establishment of proper sanitariums for the care of cancer patients in Russia. He states, incidentally, that in the past thirty years no material improvement has taken place in the treatment of the malady. James Braithwaite, of London, is authority for the theory that excess of salt is a cause of cancer. It may arise from a diet including too much meat. The other factors he considers are over-nourishment and some local irritant or stimulant, either mechanical or due to a micro-organism. He mentions the facts that Jewesses are seldom victims of cancer, and that savages who use no salt are exempt from cancer. He calls attention to the fact that all the domestic animals except the hog are subject to cancer, and that hogs alone receive no salt, while it is supplied to cattle, horses, and sheep.

Dr. Gaylord, of the University of Buffalo, believes that he has discovered the cause of cancer in an organism belonging to the protozoa. His experiments included the inoculation of seventy-two animals with this germ, with corroborative results. From his preliminary paper, published in May, 1901, satisfactory conclusions cannot be drawn, and it remains for subsequent and more detailed accounts to convince the scientific world, by which Gaylord's views are not yet accepted.

CANDIA. See CRETE.

CANNON, GEORGE Q., Mormon dignitary, died at Monterey, Cal., April 12, 1901. He was born in Liverpool, England, January 11, 1827, was converted to Mormonism in 1842, and two years later came to America, where he helped to found Salt Lake City. Later he went as a missionary to California and Hawaii, translated the Mormon bible into the Hawaiian language, and returned, after a tour of Europe, to serve as private secretary to Brigham Young. In 1857 Mr. Cannon became an apostle in his church, and soon after a leader, fighting for his faith against the most bitter attacks from all parts of the country. He served as delegate in Congress from 1872 to 1880, when he was deprived of his seat because of his polygamy. Largely through the influence of Mr. Cannon, who counseled a separation of the Mormon Church from politics, Utah was admitted to Statehood.

CANOEING. The great event of the year is the annual camp of the American Canoe Association and the championships contested for at that time. The meet of 1901 was the twenty-second, and it was held on Halfmoon Island—one of the Thousand Islands—August 9 to 23. Many old-timers, such as E. B. Edwards, C. Bowyer, Vaux, and Paul Butler, together with members from the Northern, Atlantic, Central, and Eastern divisions of the association, were present. The following is a summary of the contests: Paddling and sailing combined, $\frac{1}{2}$ mile alternately, total 3 miles, start to be made under paddle; F. C. Moore, first; Geo. McTaggart, second. Paddling, $\frac{1}{2}$ mile straightaway: G. W. McTaggart, first; F. F. Dorsey, second. Sailing, $4\frac{1}{2}$ miles, time limit 2 hours: F. F. Dorsey, first; G. W. McTaggart, second. Trophy, sailing, 9 miles: F. F. Dorsey, first; Paul Butler, second. Dolphin, sailing trophy and British Canoe Association sailing trophy, $7\frac{1}{2}$ miles: F. C. Moore, first; G. W. McTaggart, second. Open canoe, $1\frac{1}{2}$ miles: G. W. McTaggart, first; Hyam Hoyt, second. Trophy paddling, double blades, 1 mile straightaway: E. J. Minnett, Toronto, first; R. N. Brown, Toronto, second. Novice paddling, $\frac{1}{2}$ mile with turn, single blades: R. Moody, Toronto, first; A. G. Mather, Medford, Mass., second. Open canoes, single, $\frac{1}{2}$ mile with turn, single blades: E. J. Minnett, Toronto, first; A. G. Mather, Medford, Mass., second. Tandem, $\frac{1}{2}$ mile with turn, open canoes, single blades: E. J. Minnett and A. McNichol, of Toronto, first; A. G. Mather and R. Hunter, of Medford, Mass., second. Decked or open canoes, single, paddling, $\frac{1}{2}$ mile with turn, double blades: E. J. Minnett, Toronto, first; A. McNichol, Toronto, second. Rescue race, $\frac{1}{4}$ mile straightaway: R. H. Britton and Parmenter, Gananoque, first; E. J. Minnett and A. McNichol, Toronto, second. Tandem, double blades, $\frac{1}{2}$ mile with turn, open canoes: E. J. Minnett and A. McNichol, Toronto, first; R. N. Brown and J. J. Vaughan, Toronto, second. Fours, double blades, $\frac{1}{2}$

mile straightaway: E. J. Minnett, R. N. Brown, A. McNichol, and J. J. Vaughan, of Toronto, first; R. H. Britton, A. G. Mather, W. Gallow, and R. Moody, of Toronto, second. Fours, $\frac{1}{2}$ mile straightaway, single blades, open canoes: E. R. McNeill, A. L. Lynch, R. H. Britton, and C. Eastmond, of Kingston, second; R. N. Brown, J. J. Vaughan, A. McNichol, and E. J. Minnett, of Toronto, third. Tail-end race, $\frac{1}{4}$ mile straightaway: R. Parmenter, first; G. W. Begg, Toronto, second—10 starters. Relay race, open canoes, single blades, $1\frac{1}{2}$ miles over sailing course, three men from each club or division: E. J. Minnett, J. J. Vaughan, and A. McNichol, first; R. N. Brown, R. Moody, and A. G. Mather, second. Mixed tandem, $\frac{1}{4}$ mile straightaway: Miss M. H. Britton and R. H. Britton, of Gananoque, first; Mrs. J. B. Taylor and A. G. Mather, second; Miss English and R. Hunter, third. Hurry-scurry, run, swim, and paddle, standing up, open canoes: R. Parmenter, Gananoque, first; Ralph Britton, Gananoque, second. Tournament: J. McD. Mowat and R. Parmenter, first; J. Howard and A. G. Mather, second. War canoes, championship of America, 1 mile straightaway: Won by the Toronto Canoe Club. War canoe tug-of-war, one-minute heats, best two out of three: Won by Y. M. C. A., of Brockville; Toronto Canoe Club, second. Northern Division championship: Y. M. C. A. Athletic Club, of Brockville, first; Toronto Canoe Club, second. Record race: G. W. McTaggart, first; F. F. Dorsey, second.

CAPE COLONY, officially known as the Cape of Good Hope Colony, is the southernmost of the British possessions in South Africa. The capital is Cape Town.

Area, Population, and Education.—The area of Cape Colony proper, together with its various accessions from 1875, when Griqualand was annexed, to 1895, when British Bechuanaland was incorporated, is estimated at 276,775 square miles. Along the southern coast the soil is well adapted for the cultivation of grain and vines, but on the Great Karroo of the interior and in the highlands of the north, the nature of the ground is such as to make it suitable only for grazing and sheep-farming. According to the census of 1891, the population of the colony, exclusive of Pondoland and Bechuanaland, was 1,527,224, of which number the white inhabitants comprised 376,987. Of the whites about three-fifths were of Dutch descent, massed for the most part in the western districts, while the British element predominated in the country toward the east. The colored population is made up of Malays and a mixture of South African races. The inhabitants of Pondoland and Bechuanaland number about 275,000. The leading religious denomination is the Dutch Reformed Church, which embraces about one-fifth of all the inhabitants. Next in the order of numerical importance are the Anglicans, Wesleyans and other Methodists, Independents, Presbyterians, Lutherans, Roman Catholics, and Moravians. Of the native population, a very large proportion, amounting in all probably to 70 per cent., is without any religious faith. Education is not compulsory. In 1900 there were 2,613 schools, partly supported by the government, with an attendance of 110,483 children, of whom about two-fifths were of European descent. There are seven colleges with an enrollment of 650 students and a central university, which as yet is merely an examining body. In 1900 the expenditure for education was £272,214. There were 125 public libraries in 1899, and about 90 newspapers and periodicals.

Government and Finance.—By the constitution of 1872, the executive authority is placed in a governor appointed by the British crown and assisted in his duties by a council of ministers, six in number, responsible to the Colonial parliament. The law-making power is vested in a legislative council of 23 members, elected for a period of seven years, and a house of assembly of 95 members, chosen for five years. There is a small property qualification for the suffrage, but for membership in the legislative council, the possession of real estate to the amount of £2,000 or of personal property to double the value, is required. In 1901 the governor was Sir Walter F. Hely-Hutchinson (*q.v.*). As a result of the Boer war, Cape Colony with the rest of the British possessions in South Africa, has been placed under the ultimate supervision of a high commissioner, at present Sir Alfred Milner (*q.v.*). The change has been attended by a noticeable increase in the influence of the executive, necessitated in great measure by the conditions of virtual war which for some time during 1901 prevailed in the colony. The legal system is based on the old Roman-Dutch law. The highest tribunal is the Supreme Court at Cape Town, composed of a chief justice and eight associate justices. There are in addition circuit courts, assigned to the eastern, southern, and western districts, permanent and special magistrates' courts, and local justices of the peace. Military and naval contingents are regularly maintained by the Imperial government for the defense of the colony. Local military organizations, available for service in case of emergency, are the Cape Mounted Riflemen, with a normal strength of about 1,000; the Cape Police, consisting of 2,000 officers and men, and various volunteer organizations, approaching in 1898 close to 7,000 men. During 1901 naturally a much larger proportion of the inhabitants were under arms, and in the beginning of the year, when the invading Boer commandos were most active, the strength of the mounted riflemen, police, and volunteers was estimated at 12,000.

The principal sources of revenue in the order of importance are the railways, posts and telegraphs, taxation, and the public domain; the chief items of expenditure are the railways, the interest on the public debt, the penal institutions, and defense. In 1899 the revenue amounted to £8,781,212, and the expenditures to £8,190,124; in 1900 the total income was £6,565,752, a sum considerably smaller than the disbursements, which were £7,773,230. The large decrease in the revenue for 1900 is more than accounted for by the fact that the receipts for the previous year had been swelled by a loan of £2,317,000. Nearly the whole of the public debt which, at the end of 1900, amounted to £31,097,825, has been contracted in the construction of public works, the amount spent on the railways up to January 1, 1901, being £21,842,216.

Industries.—The principal industries are the rearing of sheep, cattle, and ostriches, agriculture, and mining. Farming and cattle raising are for the most part carried on by the Dutch population; mining and whatever manufacturing there is, are in the hands of the British. On the large cattle-farms of the interior and the north, covering at a rough estimate nearly one hundred million acres, there were towards the end of 1898 about 1,260,000 sheep, 5,572,793 Angora and other goats, 1,076,774 head of cattle, 387,824 horses, 260,672 ostriches, and 245,947 swine. In the same year there were produced 35,179,900 pounds of wool, 6,707,879 pounds of mohair, and 287,167 pounds of ostrich feathers. Statistics for subsequent years are not available owing to the continuance of the struggle with the Boers, but estimates tend to show that the grazing industry, more perhaps than any other, has suffered from the persistence of hostilities. These estimates are confirmed by figures showing that the export of animal products, including wool, feathers, hides and skins, declined from about £4,200,000 in 1899 to a little over £2,635,000 in 1900. The decrease of production is easily accounted for, partly by the fact that a large proportion of the adult male population has been diverted from their regular occupations to military service, and partly by the presence of marauding bands of Boers in the western districts of the colony. The principal minerals worked in Cape Colony are diamonds, copper, and coal; but there also occur manganese, lead, iron, zincblende, and gold. The latter appears as by far the most important item in the list of exports, but practically all of it is derived from the Transvaal. The diamond fields are chiefly at Kimberly, in Griqualand West, 647 miles by rail from Cape Town. Before the outbreak of war Cape Colony yielded about 98 per cent. of the world's annual output in diamonds. The total value of the precious stones exported between 1867 and 1899 has been estimated at about £92,000,000, and the average production for the last five years of the period was about £4,500,000. The value of the diamonds exported in 1900 was only £3,433,636. The output of coal was 208,655 tons in 1899, and 198,451 tons in 1900. Among agricultural products, maize and wheat take the leading place. In 1898 the maize crop amounted to 2,857,809 bushels, and the wheat crop to 2,220,747 bushels. The production of minor cereals for the same year was: Oats, 1,810,611 bushels; barley, 830,730 bushels; Kafir corn, about 2,000,000 bushels; rye, 304,491 bushels; and oat-straw, about 225,000,000 pounds. In the favorable soil of the coast region there were raised 83,000,000 vine stocks, which yielded 4,826,432 gallons of wine and 1,107,344 gallons of brandy. Many varieties of fruit, including the apple, apricot, fig, lemon, orange, pear, peach, and plum are raised in considerable quantities.

Communications.—In Cape Colony proper there are about 8,000 miles of wagon roads. Three main lines of railway setting out from Cape Town, Port Elizabeth, and East London on the southern coast, traverse the colony from north to south. At Springfontein a few miles into the Orange River Colony, the two eastern roads merge into one, while the western line skirts the borders of the two former Boer republics, and runs north to form part of the projected Cape-to-Cairo Railway (*q.v.*). Branching off from the three main lines are numerous spurs running in all directions. On January 1, 1901, there were 2,911 miles of railway in the colony. Of this amount, 2,089 miles were owned and operated by the government, 653 miles were private property, but were worked by the government, and 235 miles were both privately owned and operated. In November, 1901, five small lines, aggregating 582 miles in all, were in course of construction. The government railways have been built at a cost of nearly £10,200 per mile. In 1898 the gross earnings were £2,904,000, and the expenses £2,012,400; in 1899 the figures were £2,792,975 for receipts, and £1,180,312 for disbursements. For the year 1900 the returns showed a profit of 6¼ per cent. on the capital invested. At the end of 1899 there were 7,360 miles of telegraph line in the colony, with 22,000 miles of wire; by the end of 1900 the length of line had increased to 7,441 miles, and the miles of wire to 22,654. The net revenue in 1898 was £10,511, while operations in the following year resulted in a loss of £8,609. At the end of 1898 the post-offices in the colony numbered 942, and the postal system in that year was worked at a loss of £1,496.

History for 1901.—An account of the military operations in Cape Colony during the year will be found under TRANSVAAL. Political conditions in the colony were entirely determined by the attitude of the Afrikaner population toward the Dutch

of the Vaal and Orange River Colonies, and to the Cape government. In 1900 party lines had been sharply drawn on the question of the Treason Bill, the opposition in the parliament had carried on a violent propaganda against the measures of the ministry, in defense of the liberties of the subject as they themselves claimed, or in the interests of the Boers, as was asserted by British sympathizers, and when the legislature was dissolved in October, all the members of the Afrikaner Bond were in open discontent with the government, and some in active rebellion. The agitation was not confined to parliament. During the last two months of the year the greater part of the Dutch press engaged in a sympathetic campaign of argument and villification against the civil and military authorities, and the charges adduced by the press were reiterated at the Afrikaner Congress which assembled at Worcester on December 6, 1900, and demanded the immediate cessation of war and the restoration of independence for the Boer republics. With the revival of Boer activity in the field in the very last days of the year, and the appearance of hostile commandos within the borders of the colony, the danger of a rising among the Cape Dutch seemed imminent. No movement, however, of sufficient proportions to be termed an insurrection occurred in 1901, although undoubtedly large numbers of colonists joined the Boer forces as individuals. What rendered the position of the British authorities difficult throughout the year was not open resistance by force of arms, but the silent ill-will of a hostile population expressing itself in effective aid and comfort lent to the enemy.

This was the situation at the beginning of 1901 as described with considerable detail and some animus in a report by Lord Alfred Milner, dated at Cape Town on February 6, and published in a parliamentary blue book of April 17. While recognizing, however, the full gravity of the existing state of things, Lord Milner was inclined to take a hopeful view as to the ultimate issue of affairs. He pointed out that the bulk of the population, though probably in sympathy with the Boers, were weary of the struggle; that their aid was evoked only by the presence of armed bands among them, and that only the extremists could view with dissatisfaction the approach of a time when the burdensome requisitions of food, horses, and cattle exacted by the Boer commandos should come to an end. Lord Milner stated that he had no fear of an outbreak among the Cape Dutch for three reasons. (1) The abortive attempt at rebellion which occurred in 1900 had demonstrated the futility of any insurrectionary movement; (2) the large proportion of unruly spirits, from whom the government in the beginning might have expected trouble, had already gone to join the guerrilla bands of the Orange River Colony and the Transvaal; (3) owing to the precautionary measures of the authorities, the amount of arms and ammunition in the hands of the farmers had been greatly reduced. To restore order in the disturbed districts and to preserve order wherever it seemed to be threatened, Lord Milner recommended severity. "Personally," he wrote, "I am of the opinion, which I have always held, that reasonable strictness is the proper attitude in the presence of a grave national danger, and that exceptional regulations for a time of invasion, the necessity of which every man of sense can understand if clearly explained and firmly adhered to, are not only incompatible with, but actually conducive to, the avoidance of injustice and cruelty."

By severity Lord Milner undoubtedly meant the stricter administration of martial law, and the bringing to trial of persons guilty of sedition or insurrection, under the terms of the Treason Bill of 1900. Martial law prevailed in different districts of the colony for varying periods during the early part of the year, but from the consensus of reports it would seem that the desire for the proclamation of martial law over the entire colony was common among the large body of British subjects and among a small but influential minority of Afrikaners. Though not proclaimed as soon as had been expected, martial law was initiated in October, 1901, but for nearly half a year before that date the ordinary process of government had been dispensed with. As the time approached for the reassembling of parliament it became evident that, as the ministry advised the governor, such an event would be not only inexpedient but impracticable. After the last day of June, the government was carried on without regard for parliamentary sanction. The ordinary expenses of administration were met by customs and taxes raised on ministerial warrants. Mr. Joseph Chamberlain, in the House of Commons, admitted that parliamentary government was practically in abeyance in Cape Colony, but defended the course of the ministry as necessitated by the extreme gravity of the situation, and remarked that if the governor or his advisers should at any time be brought to account for transgressing their constitutional power, it would be the duty of the Imperial parliament to meet the emergency by passing an act of indemnity.

Under the new law of treason and the common-law, proceedings were brought during the year against a number of editors and public speakers as well as against men who had actually levied war on the government. The death penalty was inflicted in a number of cases, while sentences of perpetual banishment and of penal servitude for long terms were common. The most prominent cases were those of Malan,

editor of *Ons Land*, who was charged in January with libel against General French, perpetrated in publishing scandalous falsehoods reflecting on the character of the general and the troops under his command. At about the same time the publication of the *South African News* was prohibited. In April the editors of *Ons Land*, the *South African News*, *Het Oozen*, and the *Worcester Advertiser*, were condemned to terms of imprisonment ranging from six to twelve months. Merriman, one of the most prominent leaders of the Bond was taken into custody during the last week in August, but the case that evoked most attention was that of Commandant Lotter, a British subject of Cape Colony, who was taken prisoner near Petersburg, with his entire commando, brought to trial, condemned, and shot.

In January the bubonic plague broke out in Cape Town and spread with great rapidity, especially among the colored inhabitants. The Kaffirs were panic-stricken, and abandoned the city in large numbers, seriously delaying business in the town and the harbor. The epidemic attained its height in the latter part of August, when about 800 cases had been reported, of which 377 had terminated fatally.

CAPE-TO-CAIRO RAILWAY AND TELEGRAPH. This project of Mr. Cecil Rhodes for rail communication between northern and southern Africa made slow progress during 1901. The line is being carried northward from Buluwayo, which is 1,360 miles from Cape Town, but most of the construction in 1901 was on branch lines to the mining districts of Rhodesia (*q.v.*). The Cape-to-Cairo telegraph line, however, which, like the railway, is under British auspices, made notable advancement during the year. This line, starting at Umtali, in Mashonaland, which town has wire communication with Cape Town, in 1900 had reached Abercorn at the southern end of Lake Tanganyika, passing through Tete, Blantyre, Karonga, and Zomba. In December, 1901, it was announced that the line had been extended to Ujiji on the eastern shore of Lake Tanganyika in German East Africa. It is expected that Ujiji will be an important junction with the German East African system from Dar-es-Salaam. The English line on reaching the northern end of Lake Tanganyika will be carried northeast to Victoria Nyanza, whence telegraphic communication with the coast already exists.

CAPE VERDE ISLANDS, a group of 14 islands belonging to Portugal and lying 350 miles west of Cape Verde, have a total area of 1,480 square miles, and about 115,000 inhabitants. The population is a mixed race of descendants of negroes from Guinea and Portuguese settlers, the negro element predominating. The colony is administered by a governor appointed by the crown. The capital is Praia. The chief products are coffee, tamarinds, drugs, millet, and sugar. The estimated revenue for the fiscal year 1900 was 364,129 milreis (milreis equals \$1.08); estimated expenditure, 319,941 milreis; imports (1898), 1,558,047 milreis; exports, 194,608 milreis. About the first of March, 1901, the Eastern Telegraph Company connected St. Vincent with Falmouth, England, by cable operated in connection with the Cape-St. Helena line.

CARDINALS. The Sacred College, as the body of cardinals—bishops, priests, and deacons—in the Roman Catholic Church is known, is composed of the electors and advisers of the Pope, to whom alone the members are second in dignity. (For deaths and consecrations in the college of cardinals during the year 1901, see **ROMAN CATHOLIC CHURCH.**) The names and dates of consecration are given in the subjoined list:

Cardinal bishops: A. Agliardi (1896); Mario Mocenni (1893); L. M. Parocchi (1877); D. S. S. Oreglia (1873); S. Vannutelli (1887).

Cardinal priests: B. Bacilieri (1901); G. Boschi (1901); A. Capecelatro (1885); G. B. Casali del Drago (1899); S. Casanas (1895); Fr. di Paolo Cassetta (1899); P. G. M. Cellesia (1884); Agostino Ciasca (1899); Pierre H. Coullie (1897); S. Cretoni (1896); D. M. Dell'Olio (1901); Angelo Di Pietro (1893); A. A. Ferrari (1894); D. Ferrata (1896); J. Franciscanova de B. (1899); C. Gennarvi (1901); James Gibbons (1886); P. L. Goossens (1889); G. M. Gotti (1895); J. Herrera (1897); George Kopp (1893); G. M. J. Laboure (1897); B. M. Langenieux (1886); Victor L. Lecot (1893); M. Ledochowski (1875); Michael Logue (1893); A. Manara (1887); S. Martinelli (1901); G. A. Masella (1887); Fr. D. Mathieu (1899); James Missia (1899); P. F. Moran (1885); Adolphe Perraud (1893); Gennaro Portanova (1899); G. Prisco (1896); K. G. Puzyna (1901); M. Rampolla (1887); Pietro Respighi (1899); A. Riboldi (1901); F. M. Richard (1899); Agostino Richelmy (1899); C. M. Sanchi (1894); Giuseppe Sarto (1893); Francis Satolli (1895); L. Schlauch (1893); L. Shrbensky (1901); D. Svampa (1894); V. Vannutelli (1889); Claudius Vaszary (1893); Herbert Vaughan (1893); A. S. Zabarella (1901).

Cardinal deacons: F. Cavagnis (1901); F. S. Della Volpe (1899); L. Macchi (1889); R. Pierotti (1896); F. Segna (1894); A. Steinhuber (1893); G. C. Vives y Tuto (1899); L. Tripepi (1901).

CARLISLE, JOHN GRIFFIN, ex-secretary of the United States treasury and prominent Democratic leader, was born in Campbell County, Ky., September 5,

1835, and received a common school education. After studying law privately he was admitted to the bar in 1858, and soon afterwards was elected to the State legislature, where he served several terms. From 1866 to 1871 he was a state senator; was lieutenant-governor, 1871-75; and a member of Congress from 1877 to 1889, being speaker of the House during the last six years of that period. Under the second Cleveland administration (1893-97) he was secretary of the treasury. Upon the completion of his term he went to New York City to practice law, and during 1901 had charge of important Cuban and Porto Rican tariff claims cases against the United States.

CARNEGIE, ANDREW, retired American steel manufacturer and well-known philanthropist, disposed of gifts aggregating \$40,000,000 during 1901. He was born at Dunfermline, Scotland, November 25, 1837, and coming to the United States in 1848, began his career as a weaver's assistant. Upon the death of his father in 1851 he became the sole support of his mother, earning soon after, as a telegrapher, \$25 a month. During the Civil War he acted as superintendent of military railroads and telegraph lines, winning favorable notice by his energy; and when he organized the Keystone Bridge Company, to replace with iron structures the old wooden bridges used by the railroads, he pushed it to a quick success. His commercial history from that date coincides with the remarkable development of the steel industry in the United States, and ends with his retirement from business upon the formation of the United States Steel Corporation in 1901. Mr. Carnegie characteristically announced his retirement from active business by sending a letter to his former associates and employees at Pittsburg, offering them a fund of \$5,000,000, four-fifths of which was to be devoted to pensions for retired and disabled workers in the Carnegie mills. About the same time he made the statement, now so frequently quoted, that it is a disgrace for a man to die rich, since wealth is, properly considered, only a trust-fund temporarily put into a man's keeping for the public good. As an illustration of this doctrine, he gave in March, 1901, \$5,200,000 for the extension of the public library system of New York City, and soon after he offered to St. Louis \$1,000,000 for a new library building. Following close upon these gifts came the announcement that he had given \$10,000,000 to the universities of Scotland, one-half of which was to be devoted to scientific research and scholarships, and the remainder to the payment of the fees of poor Scotch students seeking a university training. In December it was announced that he had offered \$10,000,000 for the establishment at Washington of a national institution to be devoted to higher research work. This offer was accepted and the new institution organized. (See the following article.) To Pittsburg Mr. Carnegie had, before his retirement, given, in the form of libraries and schools, more than \$7,000,000, and during 1901 this was increased by \$1,000,000 out of the \$5,000,000 before mentioned. But beyond this he promised to the city of Pittsburg money sufficient to erect and endow the most elaborate and advanced technical school in the world. Rumor fixes the amount of this offer at \$25,000,000. Public comment on these immense benefactions is unanimous in praising Mr. Carnegie's discretion and wisdom in disposing his gifts. It is fair to assume that before the end of his great philanthropy is reached, with \$400,000,000 at his command, he will set a standard in wise giving that will bring good to millions; and his gospel of wealth is in a fair way to be regarded more seriously than as the notion of an eccentric individual.

CARNEGIE INSTITUTION AT WASHINGTON FOR THE ENDOWMENT OF RESEARCH. In December, 1901, Mr. Andrew Carnegie made known to President Roosevelt his desire to make a donation of \$10,000,000 for the foundation of a national institution of high learning. The gift was similar in its terms to that made by James Smithson in founding the Smithsonian Institution, and its purpose is similar in that the new institution is founded to supplement the work of existing institutions and not to compete with them. The new foundation is not a university in an ordinary sense of the term, for it is to confer no degrees and make no scholastic degree or title a prerequisite to a participation in the advantages which it offers. The character of the foundation was determined upon only after extended conferences with the leading educators of the country, chief among whom were ex-President D. C. Gilman, of Johns Hopkins University; President Hadley, of Yale; President Eliot, of Harvard; President Butler, of Columbia; Abram S. Hewitt, of the Cooper Union, and others.

For some years past the leading educators of the country, especially those prominent in the deliberations of the National Educational Association, have renewed the discussion concerning the foundation of a national university at Washington. In accordance with the recommendations made by these gentlemen, Congress passed, on March 31, 1901, an act throwing open the governmental collection of documents and scientific material for the use of resident students and educational institutions throughout the country; and on May 20, 1901, incorporated the Washington Memorial Institution for the promotion of science and literature, the function of

which was to assume general direction of such research study. The institution was to work in cooperation with other educational and scientific institutions throughout the country, and especially with the Smithsonian Institution and the Washington Academy of Science. The general supervisory work of the institute was to have been begun in the fall of 1901 under the presidency of Dr. Daniel C. Gilman. Prompted by the proposed plan of advanced work, Mr. Carnegie made the offer of the large endowment fund, which rendered necessary a much broader organization than had been contemplated. Late in December a very representative board of trustees was selected, as follows: John Hay, secretary of state; William P. Frye, president *pro tem.* of the Senate; David B. Henderson, speaker of the House of Representatives; S. P. Langley, secretary of the Smithsonian Institution; John S. Billings, of New York; William M. Frew, of Pittsburg; Lyman J. Gage, of Illinois; Daniel C. Gilman, of Baltimore; Abram S. Hewitt, of New York; Henry L. Higginson, of Boston; Henry Hitchcock, of St. Louis; Charles L. Hutchinson, of Chicago; William Lindsay, of Kentucky; Wayne MacVeagh, of Philadelphia; D. O. Mills, of New York; S. Weir Mitchell, of Philadelphia; William W. Morrow, of San Francisco; Elihu Root, of New York; Charles D. Wolcott, director of the Geological Survey; Carroll D. Wright, commissioner of labor; President Roosevelt; Justice Edward D. White; Senator John C. Spooner; Ambassador Andrew D. White, and Mayor Seth Low, of New York.

Among the purposes of the foundation that are specified in the deed of gift are the following:

First—To promote original research, paying great attention thereto as one of the most important of all departments.

Second—To discover the exceptional man in every department of study whenever and wherever found, inside or outside of schools, and enable him to make the work for which he seems specially designed his life work.

Third—To increase facilities for higher education.

Fourth—To increase the efficiency of the universities and other institutions of learning throughout the country, by utilizing and adding to their existing facilities and aiding teachers in the various institutions for experimental and other work, in these institutions as far as advisable.

Fifth—To enable such students as may find Washington the best point for their special studies to enjoy the advantages of the museums, libraries, laboratories, observatory, meteorological, piscicultural, and forestry schools and kindred institutions of the several departments of the government.

Sixth—To insure the prompt publication and distribution of the results of scientific investigation, a field considered highly important.

It is not proposed for the present to erect any extensive buildings; a building formerly used as a private dwelling will for the present serve as administrative headquarters.

CAROLINE AMELIA, Princess of Schleswig-Holstein-Sonderburg-Augustenburg, member of the German royal family, died at Cairo, Egypt, May 3, 1901. She was born at Augustenburg, January 15, 1826, the daughter of Duke Christian August, of Schleswig-Holstein, and Louisa Sophia, Countess of Danneskjöld Samsøe. Princess Amelia was the elder sister of Prince Christian, of Schleswig-Holstein.

CAROLINE ISLANDS, a group of islands in the Pacific, lying between the Philippines and the Marshall Islands, to the north of New Guinea, 526 in number, have a total area of about 800 square miles and a population estimated at 42,700. They constitute a part of the island possessions purchased by Germany from Spain in February, 1899. They form some 26 groups, of which the most important are the Pelews, Yap, Uluthi, Uleai, Namonuito, Rug, Mortlocks, Ponape, and Kusaie. Rug has about 15,000 inhabitants and Ponape 4,000. The inhabitants are Micronesian, with admixtures of the Negrito, Papuan, Japanese, and Chinese races. They are governed as a part of the German New Guinea protectorate, with local capitals at Yap and Ponape. The products are bread fruit, cocoanut, oranges, cloves, sugarcane, etc. Agriculture is rude, and the commerce, which is controlled by the German Jaulit Company, is small. The company has stations on the more important islands. Germany appropriated 370,000 marks for the expenditures in 1901. American missionaries have stations on many of the islands, and the inhabitants have largely been converted to Christianity.

CARTE, D'OYLY (Richard Doyle McCarthy), British impressario and theatrical manager, died in London, April 3, 1901. He was born in 1844 in London, and was educated at the University College School and London University. He then began to write songs and minor operettas, and established a concert agency of some importance. In 1870 he began his career as a producer of light opera, and soon effected the partnership of W. S. Gilbert and Sir Arthur Sullivan, and presented *The Sorcerer* in 1887. Following this, he produced *H. M. S. Pinafore*, *The Pirates*

of *Pensance*, *Patience*, *Iolanthe*, *Princess Ida*, *The Mikado*, and other compositions of the joint authors. He built the Savoy theatre in London, which was opened with the first production of *Patience*. D'Oyly Carte also built the Royal English Opera House, now the Palace Variety, for the special production of Sullivan's one grand opera, *Ivanhoe*. He presented some of the Gilbert and Sullivan operettas in New York City.

CASABIANCA, MANUEL, Colombian general and politician, died in Bogotá early in June, 1901. He was born in the Dutch colony of Curaçao in 1843, and fought in the Colombian army through several revolutions. General Casabianca was for many years a prominent military and political figure in his adopted country, and held various important offices under different Colombian presidents.

CASCAJARES Y AZARA, ANTONIO MARIA, cardinal, died at Callahora, Spain, July 27, 1901. He was born at Colanda, in the archdiocese of Saragossa, May 2, 1834, and was created a cardinal priest of the Roman Catholic Church in 1895. Cardinal Cascajares y Azara was one of the most scholarly of the Spanish clergy, and it was largely due to his efforts that the papal university at Valladolid was established and opened in 1894.

CASSATT, ALEXANDER JOHNSTON, president of the Pennsylvania Railroad, in 1901, was prominent in the adoption of plans for an improved approach to New York City for his road, the plans providing for a tunnel under the North River from Jersey City, an underground station in the metropolis, and a tunnel under the East River, connecting with the Long Island Railroad. Born at Pittsburg, December 8, 1839, and educated at the University of Heidelberg and at the Rensselaer Polytechnic Institute, Troy, N. Y., Mr. Cassatt began his career as a railway surveyor in Georgia, 1859-61. Entering the service of the Pennsylvania Railroad as rodman in 1861, he rose steadily, and by 1871 had become superintendent of the system. In 1874 he was chosen third vice-president, and in 1880 first vice-president; in the following year he resigned. From 1883 to 1899 he was a director of the road, and in the latter year became president.

CASTLE, EGERTON, the English romantic novelist, who, with his wife, Agnes Castle, published in 1901 *The Secret Orchard*, was born in London, March 12, 1858, and was educated in the universities of Paris and Glasgow. After a short experience in the British Army, he joined the staff of the *Saturday Review* (1885), where he remained until 1894. Among the books published by him are: *Schools and Masters of Fence* (1884); *Consequences* (1891); *English Book-Plates* (1892); *The Light of Searthey, A Romance* (1895); and, with Agnes Castle, *The Pride of Jennico* (1898) and *The Bath Comedy* (1899). Mr. Castle is the publisher and part owner of the *Liverpool Mercury*.

CASTRO, General CIPRIANO, president of Venezuela, whose government in 1901 was beset by revolutionary movements and international complications, was born near Capaolio about 1862. Castro, who is well educated, first came into prominence under General Crespo, as one of the leaders of the Liberal party, though he refused to accept a place in Crespo's cabinet when the latter was made president. In 1899 he headed a revolution against the administration of President Andrade, and in the fall of that year became provisional president. In 1900 he was formally elected to the presidency. See VENEZUELA, paragraph on History.

CATHOLIC CHURCH. See ROMAN CATHOLIC CHURCH.

CATHOLIC COLLEGES OF THE UNITED STATES, CONFERENCE OF THE. The third annual conference was held at Chicago, April 10-12, 1901, delegates, representing 70 colleges, being present. The report of the secretary shows that 1,000,000 students are being educated in Catholic schools, of which 30,000 are in institutions of higher learning. Parochial schools have multiplied rapidly in the past few years; in the resolutions of the conference emphasis is laid upon the necessity of developing the high school, as a connecting link with the Catholic college, to whose growth the church is paying great attention, the crown of the system being the Catholic University (*q.v.*) at Washington. The address of the presiding officer, Rt. Rev. Mgr. Thomas J. Conaty, D.D., rector of the Catholic University, dealt largely with the Catholic opposition to the unification of education under state control, as "a mighty machine of secularized instruction." Many other questions affecting Catholic interests were discussed. President, Rt. Rev. Mgr. Conaty, D.D.

CATHOLIC SUMMER SCHOOL OF AMERICA, at Cliff Haven, N. Y., on Lake Champlain; decennial session held July 7 to September 6, 1901. The summer school is modeled on the Chautauqua system. It is intended to build up a summer settlement about the school which will in the near future aggregate a population of 5,000, and a system of sewerage, water-supply, and lighting has been planned. Inducements are being made to Catholics to build their own dwellings,

but many cottages have already been erected by the trustees. Many improvements were made in 1901. The primary import of the summer school is to give the Catholic point of view on issues of the day in history, literature, philosophy, political science, economics, science, religion, etc., and to afford means for social intercourse and recreation. The session of 1901 included over 80 lectures by eminent Catholic and other writers and thinkers. Several courses of special study were offered and a number of educational conferences took place. A new musical society was organized in Plattsburg, under the Champlain Choral Union. President of the school, Rev. Michael J. Lavelle, LL.D., New York; secretary, Warren A. Mosher, Youngstown, O.; official organ, *Mosher's Magazine*.

CATHOLIC UNIVERSITY OF AMERICA, Washington, D. C., is an institution of wholly a university character, since it gives instruction only to young men who have completed collegiate courses at affiliated colleges or elsewhere. The registration during the year 1901 was 165, a slight decrease from the preceding year. During 1901 one new institution, St. Austin's, was affiliated. This college was established in the neighborhood of the university in the summer of 1901 by the Sulpician fathers. During the year an increase of more than \$40,000 was made to the endowment. The library contains about 35,000 volumes, this being an increase of 3,000 over the preceding year.

CATTELL, JAMES McKEEN, professor of psychology in Columbia University, was elected to the National Academy of Sciences at the spring meeting of 1901. He was born at Easton, Pa., May 25, 1860, and was educated at Lafayette College, receiving the degrees of A.B. (1880) and A.M. (1883). After studying at Johns Hopkins University and various European laboratories he took the degree of Ph.D. at Leipzig in 1886. He was lecturer at the University of Cambridge in 1886, and in 1888 was appointed professor of psychology at the University of Pennsylvania. In 1891 he went to Columbia as professor of experimental psychology, being placed in charge of all work in psychology in 1896. Professor Cattell has played an important part in instruction in psychology in the United States. Besides being the first professor of psychology at an American university, the laboratory he established at the University of Pennsylvania was the first in which undergraduate instruction was given, and his present laboratory at Columbia University is probably the largest and best equipped in the world, occupying, as it does, some 19 rooms. He is the president of the American Society of Naturalists and chairman of the advisory board of the New York State Pathological Institute. He is active in the American Association for the Advancement of Science, having been for some years a member of its council. He served as vice-president of the New York Academy of Sciences and is the editor of *Science*, *The Popular Science Monthly*, the *Science Series*, and the *Psychological Review*. Professor Cattell's scientific researches and publications have been chiefly in the direction of applying experimental and exact methods to the study of mental processes, the measurement of mental time and intensity, the perception of space, experiments on memory and the association of ideas, mental statistics and similar subjects.

CAVITE FEVER. An endemic fever principally confined to the vicinity of the peninsula of Cavite, though sporadically invading other parts of the Philippines, and so named by Surgeon George Pickering, United States Navy. At least 70 per cent. of the marines quartered at the naval station at Cavite have suffered from one or more attacks of the disease, newcomers contracting it within two or three weeks after arrival. It is an acute infectious disease, with abrupt onset, characterized by high temperature, severe muscular pain, and very painful and tender eyeballs. The cause of Cavite fever is supposed to be a specific micro-organism, not yet isolated. The period of incubation is apparently from two days to two weeks. After a slight chill, the patient suffers from a temperature of 104° or 105°, or even 107°. The face is flushed; the ocular conjunctiva is injected and very painful; the skin is hot; the pulse full, strong, and accelerated; delirium is not infrequent, and the patient shows signs of extreme prostration. Usually nausea and vomiting, constipation, scanty urine, headache, as well as severe muscular pain, are present. After three, four, or five days the temperature falls, and generally the muscular pain decreases with the decline of fever. Cavite fever may be confounded with dengue but is distinguished from it by the absence of an afebrile period and of a rash. There are no catarrhal symptoms. Cold sponge baths, or "tubbing," as in typhoid, are recommended for reduction of temperature, together with an ice cap to the head for local relief. Rest in bed, calomel, acetanilid, and quinine are used during the attack, and tonics containing strychnine, iron, and quinine for ten days after the subsidence of the fever and the disappearance of pain. Peripheral neuritis has followed some severe attacks of the disease, with foot-drop and muscular atrophy.

CAZIN, JEAN CHARLES, French painter, died in Paris, March 27, 1901. He was born at Samer, Pas-de-Calais, about 1840, and received his instruction in designing from Lecoq de Boisbaudran. He exhibited at the Salon first in 1876, and received the medal of the first class there in 1882, and also participated in many other exhibitions, notably that of *l'Union des Arts Decoratifs* of 1882. His best-known paintings are "The Flight Into Egypt" (1877); "Tobit" (1880); "Ishmael" (1880), now in the Luxembourg Gallery, and "Judith" (1883). While he included figures in his work, they appear only as parts of his landscape, never superior to it, and in his moonlight effects he endowed twilight with a melancholy tenderness that is unexcelled. He became a member of the Legion of Honor in 1882 and was promoted to officer in 1889.

CELEBES, one of the Dutch East Indian islands, lying east of Borneo and south of the Philippine Islands, has an area of about 72,000 square miles and a population estimated at 2,000,000. The island is in charge of a governor, acting under the authority of the governor-general of the Dutch East Indies. The principal towns are Menado, Port Rotterdam, and Vlaardingen (Macassar). The divisions of the island are for the most part native states recognizing Dutch authority. The products are similar to those of the other East Indian islands. See **DUTCH EAST INDIES**.

CENSUS. For the results of the censuses taken in foreign countries in 1900 and 1901, see **AUSTRALIA**, **AUSTRIA-HUNGARY**, **BELGIUM**, **CANADA**, **FRANCE**, **GERMANY**, **GREAT BRITAIN**, **INDIA**, **ITALY**. The results as to population of the census taken in the United States in 1900 were made known near the close of that year. The census returns in the United States, however, included many other tabulations beside that of population. These tabulations were conducted with much greater rapidity than ever before, and a large number of them were made public by the end of the year 1901. For the total population of the United States as composed of native whites, foreign whites, native whites born of foreign parents, and negroes, see **POPULATION**. For the geographical distribution throughout the country of the negro population and its relative degree of literacy, see **NEGRO PROBLEM**. For the relative degree of literacy of the various elements of the population of the United States, see **EDUCATION**. For the total population of each State and of the largest cities in the State as ascertained by the census in 1900 and as computed by the government actuary in 1901, see the articles on the several States. The statistics of agriculture of each State for 1900, as ascertained by the census, were not available except in a few instances by the end of the year 1901, and they have therefore not been included. On the other hand, the exhaustive researches made by the census as to the manufactures and industries of each State and their growth during the decade were in most cases available, and abstracts of them have been included in the articles on the several States. The Census Bureau has not been content to make these articles merely statistical, but has in nearly every case shown the peculiar economic advantages or disadvantages of each State in regard to specified industries, and has thus added greatly to the value of the statistics.

CENTRAL AMERICA, with an estimated area of upwards of 170,000 square miles and an estimated population of about 3,500,000, includes the five republics of Guatemala, Honduras, Salvador, Nicaragua, and Costa Rica, and the colony of British Honduras. These states are treated under their own titles. A series of treaties were concluded in February, 1901, among the Central American republics, authorizing arbitration for the settlement of future disputes. In the fall of 1901 it was rumored that President Zelaya, of Nicaragua, was attempting to bring about the federation of the several republics. In view of the failure of the well-developed movement toward the same end in 1897-98, such an attempt now seems to have little promise of success.

One of the most important subjects concerning Central America as a whole continues to be the development of German interests. Although these interests have suffered during the last few years, largely on account of the unfavorable coffee market in Europe and the United States, it does not seem likely that they will fail to advance. The Germans in Central America are "foremost in every profession, trade, and occupation," and they control not only all of the commerce with Germany, but most of it with Great Britain and California. The total trade with Germany has amounted annually to from \$7,000,000 to nearly \$12,000,000. German farms and plantations in Central America comprise more than 742,000 acres, on which some 20,000,000 coffee trees are planted. In Guatemala, where German interests are strongest, almost one-half of the entire coffee and sugar crops are under German control. Early in 1901 it was announced that Germany had established a consulate-general at Managua, Nicaragua, the appointed incumbent being the first German salaried consul in Central America. He has consular jurisdiction throughout the five republics. Though German investments in Nicaragua amount in value to less than

one-fourth of those in Guatemala, the former state was preferred for the new consulate on account of the importance of that region in view of the probable construction of the Nicaragua Canal. For trade with the United States, see UNITED STATES (paragraph Commerce).

CEYLON, an island in the Indian Ocean off the southern extremity of Hindustan, constituting a British colony, has an area of 25,365 square miles, and an estimated population (1901) of 3,576,990, a gain over the census of 1891 (3,009,461) of more than 18 per cent. Population by races: Singhalese, 2,334,570; Tamils, 950,844; Moormen and some other races, 249,572; Eurasians, 23,253, and Europeans, 9,583; besides some Veddahs, possibly the aborigines of Ceylon, Afghans, and Malays. Considerably over half of the population is Buddhist. The capital is Colombo, a port on the west coast. In 1899 there were 47,482 pupils in government schools, 111,145 in subsidized schools, and 34,841 in unaided schools, a total of 193,468 receiving regular instruction, or about 1 in 16 of the population. The royal college, a government high English school, and other subsidized English schools, exist, and there are a number of schools for technical or industrial instruction.

Government and Finance.—Since 1815 Ceylon has been under British rule. It is administered by a governor, aided by an executive council; and the members of this council, with several other officials, constitute a legislative council. The colony is divided into nine administrative provinces, over each of which a government agent presides. There is also a system of municipal and local administration. The military and naval forces are a part of the regular establishment of Great Britain. Ceylon has no navy, coast defenses being supplied partly at colonial, partly at British, expense. The regular British troops of all arms number 1,771, and there is a volunteer force numbering 1,838. The local monetary unit is the rupee, worth 32.4 cents. The colonial revenue for 1900 was 27,325,930 rupees, against 25,913,142 rupees in 1899; the expenditure, 28,948,925 rupees, against 24,950,940 rupees in 1899. The public debt in 1900 was £3,419,451, and the local silver debt, 3,239,585 rupees, both incurred entirely for public works, including railways. The revenue is derived chiefly from customs (yielding in 1899, 6,752,367 rupees), the government salt monopoly, port dues, stamps, and licenses on spirituous liquors. The principal items of expenditure are for establishments (5,931,333 rupees in 1899), public works, the army, and interest on the debt.

Industries and Commerce.—Including the grazing lands, about one-fifth of the area of the island is under cultivation. In 1900 the areas of the leading crops were as follows: Rice, 672,584 acres; other cereals, 109,095 acres; tea, 405,405 acres; coffee, 7,086 acres; cocoanuts, 846,115 acres; cinchona, 437 acres, and cinnamon, 39,619 acres. The live stock in 1899 included 1,357,800 cattle, 84,215 sheep, 89,474 swine, and 156,874 goats. The native industries include manufactures of gold, silver, ivory, and tortoise shells, pottery, oil refining, sugar, mats, fans, and wood carving. Gems are mined to an extent that has made the island famous in this regard, 491 quarries being worked in 1899. In the Gulf of Manaar extensive pearl fisheries are operated. The total imports of the colony for 1900 were 122,339,578 rupees, an increase of 10,347,409 rupees over 1899; the exports, 94,962,277 rupees, a decrease of 6,614,630 rupees. Nearly one-half the imports are from India, and nearly one-fourth from Great Britain. The largest export is tea, amounting in 1899 to 129,661,908 pounds. Coconut oil, cinnamon, and coffee are also largely exported. The yield of graphite, the purest quality of which is found in Ceylon, has fallen off about one-half in the last few years, and the market is being taken by Bavaria, where refining processes have produced a quality nearly equal to that of Ceylon. The annual production in late years is about 12,000 pounds, mostly exported.

In 1900 there were 298 miles of railroad open to travel. The post and telegraph offices number 367. There are 2,451 miles of telegraph wire.

History.—In April, 1901, Ceylon received the Duke and Duchess of York, who were welcomed by the governor and legislative council. The whole number of Boer prisoners received up to October 18 was 5,125. Many of these have offered to enlist in the British army for service outside South Africa, and have taken the oath of allegiance to Great Britain. The reports of their treatment in Ceylon have been wholly satisfactory. At the opening of the legislature in October, 1901, the governor, Sir J. West Ridgeway, announced that considerable progress had been made in railway extension, irrigation, and other public works, and that the finances, trade, and industries were in good condition. A commission was appointed to consider the subject of taxation. At Colombo extensive harbor improvements have been undertaken.

CHANNING, WILLIAM ELLERY, American author, died at Concord, N. H., December 23, 1901. He was born in Boston, November 29, 1818, and was educated at the Boston Latin School and Harvard College. Removing first to Illinois in 1839, he later went to Cincinnati, where he was connected with the *Gazette*, and returned

to Massachusetts in 1842. Afterward he was engaged with the *New York Tribune*, the *New Bedford Mercury*, and the *Boston Journal*, and he was one of the contributors to the *Dial*. Among his publications are a number of volumes of verse and many prose essays. He was a close friend of Thoreau and Emerson, living in entire sympathy with the so-called "Concord School." He wrote: *Near Home* (1858); *The Wanderer: A Colloquial Poem* (1871); *Thoreau, the Poet-Naturalist: With Memorial Verses* (1873); *Eliot: A Poem* (1885); and *John Brown and the Heroes of Harper's Ferry: A Poem* (1886). He was a nephew of the great preacher, William Ellery Channing.

CHARLESTON EXPOSITION. See SOUTH CAROLINA EXPOSITION.

CHARITY ORGANIZATION. Charity work continues to progress along lines of cooperation, centralization, and methodization. The consolidation of three magazines has given subscribers in a compact form a periodical meeting the needs of those interested in charity work. In 1897 *Lend a Hand* was combined with *The Charities Review*. Beginning with January, 1901, *The Charities Review* appeared as the monthly issue of *Charities*, published by the Charity Organization Society of New York. *Charities* continues to be a weekly review of local and general philanthropy, "dealing with current news relating to charities, social reform, preventive work of all kinds, legislation concerning charitable interests, and other matters of interest to members of philanthropic and reform bodies, and to public-spirited citizens." In addition to the usual interest in the dependent, the defective, and the delinquent, charity workers are broadening the basis of their work by paying special attention to the standard of living. Specific subjects that also created interest during 1901 are consumption, juvenile courts, and the training of charity workers.

Standard of Living.—Sidney Webb recently said that twentieth century politics, so far as concerns home affairs, will be dominated by the idea of the compulsory maintenance of the standard of life. Charity workers are recognizing this necessity in their individual and preventive efforts, and at their summer school devoted a day to the discussion of the standard of living and the way in which it may be raised or lowered by the remedies offered. Mr. Homer Folks, in an address at the annual meeting of the Boston Associated Charities, expresses this feeling: "I think the city should cooperate with the labor unions in maintaining and establishing the eight-hour law and the prevailing rate of wages. . . . I conceive that it is the city's duty . . . to help to establish a standard of living as good as possible. . . . Charity organizations are from day to day, perhaps more or less consciously, fixing the standard of living for hundreds of families, and in that light these families and their neighbors, friends, and relatives must read our idea of what the standard of living should be. . . . We should not acquiesce, much less impose, upon our beneficiaries, an unwholesome standard of living, but we should on all occasions so exert our influence and so direct our practice as to raise their standard of living, at least to what we consider the minimum consistent with health, property, and good citizenship. . . . Restoration to self-support is not necessarily a satisfactory result, for there may be and there often is self-support at a standard of living which is inconsistent with well-being. . . . There are all sorts of people who are on a basis of economic independence, but the condition and nature of whose occupation is such as to impair the vitality, undermine the morals, and blast the future of themselves or others." Mr. Seth Low, in a speech to labor organizations during the campaign in New York City, explicitly promised support to the doctrine that it was part of the business of a municipality to aid in securing a certain standard of life, wages, and comforts. He pledged himself to secure eight hours for city work, contract or not, to use city resources to rehouse, if necessary, and in all respects to make the city an employer whose first care should be that a certain standard of life was maintained. In commenting on this point of view, *Charities* remarks that "it transforms the conception of the standard of living from a merely individual or family ideal into one that is purely social. It implies an obligation on the part of the community toward its social dependents."

Tenement-House Reform.—The practical form which this interest in the standard of living has taken is the investigation of the tenement-house problem. A number of prominent charity organizations, notably those of New York, Cincinnati, Kansas City, Indianapolis, Boston, and Chicago, are giving special attention to the housing problem. The Charity Organization Society of New York is trying to have the new tenement law properly enforced; the Cincinnati, Kansas City, and Chicago organizations are making extensive investigation. Mr. Devine, in reporting for the committee on "Improved Housing" at the second New York State conference, says that there are three ways to eliminate this evil: (1) Restrictive legislation; (2) sanitary inspection; (3) educational propaganda. The educational propaganda is being carried on by means of lectures illustrated by stereopticon views of various tenements and their surroundings. The tenement-house exhibit prepared by the

Charity Organization Society of New York for the Paris Exposition was on exhibit at the Pan-American Exposition at Buffalo, and it is desired to send it to other cities. It consists of models of a block of existing tenement-houses in the city of New York as it stood on January 1, 1900, a block of typical tenement-houses built in accordance with the laws in force January 1, 1901, and a block of model tenements; photographs illustrating tenement-house conditions in other American cities, and photographs of model houses in various parts of the United States. It was through the efforts of the tenement-house committee of the Charity Organization that the State appointed the Tenement-House Commission of 1900, the result of whose work is embodied in the new tenement-house act. In Kansas City a company has been formed to build small cottages on a tract of land three miles outside the city. Of interest in this connection is the decision of the London County Council to buy 225 acres on which to build workmen's houses to accommodate 42,500 persons at a cost of £1,500,000.

Consumption.—Philanthropic workers are becoming interested in tuberculosis from two standpoints: (1) The growing recognition of its contagious character and its relation to the whole community; (2) the misery which it brings to hapless workers who are dependent upon their work or have others dependent upon them. Many working people become homeless and subjects for charity as the disease progresses. Others are obliged to remain at work during the incipient stages, when a cure is possible. In both cases the afflicted person is a centre of contagion in lodging houses, homes, and workshops. The danger from tuberculosis is an important item in the tenement-house problem, since cleanliness, light, and ventilation are necessary to stop its ravages, and the mortality increases with the density of population. The remedies are, therefore, the improvement of the conditions under which people live and work, and the establishment of institutions for incipient cases. Sanatoriums for adults and seaside homes for children afflicted with scrofula are advocated. France has two public sanatoriums and a dozen private ones. The New York State legislature has recently provided for one in the Adirondacks. Other States are considering similar appropriations. Pennsylvania permits residence on the forest reserves, and furnishes tents and fuel. Private philanthropy has endowed a number of institutions—Stony Wold, in New York; Free Hospital for Poor Consumptives, in Philadelphia; National Jewish Hospital, of Denver; Indigent Consumptive Aid Association of America; the Rocky Mountain Industrial Sanatorium, of Colorado, for people of small means, and the free hospital near Toronto, founded by the National Sanatorium Association of Canada. The problem for charity workers is to provide for the proper care of incipient cases and make it possible for them to stop work and be removed to a place where they will not spread the disease.

Juvenile Courts.—The successful working of the Chicago Juvenile Court has created a general interest in the treatment of youthful offenders throughout the country. An amendment of the Illinois law went into effect July 1, 1901, and provided that any child under 10 years old found begging or selling articles or singing or playing musical instruments on the streets might be presented to the Juvenile Court as a dependent. As a result the Visitation and Aid Society are trying to stop begging. The Illinois law has taken a strong hold of the societies and institutions caring for children in Chicago and has furthered cooperation between them. The chief probation officer's salary is provided for; the other officers are paid by private charities, the Visitation and Aid Society supplying three. The officers report that the homes of the children are improved as the result of the supervision. During the three years prior to the passage of the law, Cook County Jail held 1,705 boys under 16 years. In the past two years hardly a dozen have been imprisoned. For Wisconsin, Pennsylvania, the District of Columbia, and St. Louis, Mo., laws have been enacted similar to the Illinois law. The law went into force in Milwaukee, July 1, 1901. Kansas City, without State legislation, has arranged for special rooms in the county jail, and probation officers are provided from private sources. The new court has already been organized in Philadelphia. Section 1,399 of the revised charter of New York establishes a children's court. Through the efforts of the Charity Organization Society the amended charter of Buffalo provides for 5 probation officers and a separate court.

Training for Charity Workers.—Mr. Frank Tucker, general agent of the New York Association for Improving the Condition of the Poor, in an article on *What a Charity Worker is Expected to Do*, says: "We expect the charity worker to see facts, to record facts, to use facts, to learn resources, to develop resources, to use resources, to classify results, to produce results, to record results, to deduce principles, and to formulate principles." To summarize in another way, the charity worker must gather relevant and essential facts and have incidents in mind to illustrate important discussions; executive ability to meet the present conditions and provide a remedy; knowledge of public and private charitable institutions, of the personality of gov-

erning boards, and of charitably inclined individuals; and the history and development of charity work, the methods that have been tried and failed, and those now in force. Professionalism in charity work began when "a standard of qualifications was set up governing paid workers." There is now a growing recognition of the need of placing the care and treatment of dependent members of the community in the hands of people who have natural qualifications for the work and who have been educated and trained to follow it as a profession. There is an increasing demand for such workers in charity organization societies and kindred agencies, as well as in some public positions. The announced appointments of Mr. Seth Low, elected mayor of New York in November, 1901, show the character of some of the leaders in charity work. Mayor Low himself was a vice-president of the Charity Organization Society, and a valued coadjutor. His appointments include the president of the Charity Organization Society as tenement-house commissioner; an assistant secretary as deputy tenement-house commissioner; an active worker on three important committees as commissioner of public charities; five other members of the tenement-house committee to minor positions, and the head of the University Settlement as private secretary to the mayor. Mr. Jeffrey R. Brackett, in a paper read at the National Conference of Charities and Corrections outlines the present opportunities for training in charitable work. He distinguishes first between training and instruction. There has been an increase in a number of the courses offered on public aid, charity, and correction in universities, colleges, and theological schools. For professional training, however, in experience, there is yet no school. Boston and Baltimore associated charities have given the applicants for positions as district agents a certain period of instruction under the general secretary. Philadelphia plans to do the same thing. The St. Louis Provident Association has undertaken to train some visitors and employees of the association. For three years the general secretary of the Boston Associated Charities has had a study class in which members not only read, but study books and papers and compare experiences. The Summer School in Philanthropic Work, conducted by the Charity Organization of New York, and begun in 1898, offers a valuable course, especially designed for professional charity workers. The requirements for admission are a college degree or a year of actual service in philanthropic work. The course lasts six weeks and consists of lectures and discussions, special inquiries, visits to institutions and agencies, and training with experienced workers in charity and correction. The speakers are leaders in their lines of work. In 1901 the programme of the course, from June 17 to July 27, was arranged as follows: Three weeks to the treatment of needy families in their homes; one week to the care of dependent, neglected, and delinquent children, and the remainder of the time to medical charities, the institutional care of adults, neighborhood improvements, and the scope and methods of charity organization. Another movement, with a social feature, is the formation of city clubs of charity workers. Boston has had a Monday Evening Club for several years. In December, 1901, New York formed a Monday Club, to which any person receiving compensation for charity or philanthropic work is eligible. On November 4, 1901, Baltimore formed the Eight O'clock Club, to meet on the first and third Mondays of each month. Cincinnati has a club, organized three years ago, modeled after the Boston club. These clubs have simple constitutions, and small fees (usually a dollar). Papers or informal discourses, followed by some form of entertainment and simple refreshments, make up the programme. The aim is to discuss problems from a local standpoint and to increase the acquaintance and thus the cooperation of charity workers. The files of *Charities*, reports of societies, and national and local conferences are providing students with a valuable literature.

Work of Charity Organizations.—Baltimore. During 1901 twenty new charity organization societies were formed. The principal work of the Charity Organization Society of Baltimore has been the revision of the Charities Directory for the second time, which has been undertaken by volunteer workers. The society reports an advance in constructive work, a growing appreciation by police and press of relief administered without publicity; an increased cooperation between the society and private agencies; the complete substitution of The Friendly Inn for the free lodgings at police stations and the almshouse, and the placing of the city almshouse under trained charity workers. The society has increased the city districts from six to eight, and has two neighborhood houses, with the promise of others.

Boston. The reports of the district conferences are the unique contribution of the report. They contain such interesting data as the following: "An analysis of 153 cases out of 180 new ones, showing the effect of an increased demand for labor and an unusually mild winter, which resulted in a larger proportion of applicants where condition was due to moral shortcomings"; and particulars regarding cases that have been under the care of one visitor for several years. This conference reports 65 families that have become self-supporting in the last ten or twelve years.

Many questions are raised by these conferences. The Boston Associated Charities work is characterized by the stress laid on friendly visiting.

Buffalo. The "church district plan" gives a special interest to the work of the Buffalo society. It is reported as "still experimental." At the instance of the Charity Organization Society, 101 churches of all denominations, including Roman Catholics, Jews, Unitarians, and the Salvation Army, and also the nine settlements of Buffalo, have accepted small districts from the Charity Organization Society, within which they are responsible for the care of the neglected poor of any faith. The object is to cultivate friendliness, in addition to almsgiving. At the church conferences the Charity Organization Society urges uplifting social work, such as libraries, penny provident funds, kindergartens, and classes.

Cambridge. This report is devoted chiefly to a discussion of cases of desertions. Seventy-one families were investigated in order to discover the cause of desertion, with the following result: Intemperance in 23 cases; licentiousness in 12; lack of thrift, incompatibility, unwise philanthropy, gambling, and roving disposition in other cases, while bad cooking and wretched housekeeping have much to do with it.

Chicago. The activities of the Bureau of Charities have included vegetable gardens, summer outings, and home libraries. Its secretary states that: "In accordance with its fixed policy of entering actively into public efforts intended to improve living conditions among the poor, the bureau, by accredited representatives, participated during 1901 in numerous movements of a philanthropic character.

Cleveland. The first annual report of the Associated Charities, which succeeds the Bethel Associated Charities, lays emphasis on friendly visiting and district organization. The city has been divided into twelve districts on ward lines. Each district has a physician and 7 to 24 visitors. This report contains a list of the charity organizations of the city.

Minneapolis. The Associated Charities report announces four definite plans for the future: (1) To establish two district conferences; (2) to start an educational canvass as propaganda for organized charity; (3) to publish a charities directory; (4) to extend the work of the penny provident fund.

New York. The notable achievement of the Charity Organization Society of the City of New York is the passage of the Tenement-House Act. The tenement-house committee has been reorganized to see that the law is enforced and to encourage private investment in improved tenements. The central office of the society serves as a bureau of information for (1) destitute persons; (2) persons wishing information and advice regarding people in distress; (3) persons who are desirous of starting charity organizations or institutions. By means of correspondence, *Charities*, its reference library, its summer school, its *Charity Directory*, monthly conferences conducted during the winter, local district conferences, and lectures arranged for by the districts, the society exerts a constantly increasing influence upon the charitable work of New York City and the country at large. The reference library deserves special mention. It contains 2,100 volumes, 1,200 pamphlets, and 80 periodicals, and an extensive system of newspaper clippings.

Philadelphia. The Philadelphia Society for Organized Charity announces a gift of \$50,000 for a Wayfarers' Lodge and Woodyard. The new building, which will be fireproof and will contain facilities for bathing, ventilation, and disinfecting, precautions against fire, a large assembly and reading room, a smoking room in the basement, 16 beds for women, and 208 beds for men, will be ready in May, 1902. In 1901 30,690 lodgings were given at the two woodyards, and 61,274 meals, at a cost, after deducting the labor, of \$4,081.62. The society distributed 10,000 pamphlets entitled *Concerning Tramps and Beggars*. A system of training all paid workers for six months by the general secretary is planned.

St. Louis. St. Louis has no charity organization, but the different societies cooperate to some extent, and the St. Louis Provident Association endeavors to perform the functions of a central organization by carrying on similar activities and promoting cooperation. Conferences of workers and monthly meetings have been organized.

San Francisco. The medical needs of San Francisco are provided for by visiting nurses and the cooperation of doctors. San Francisco has just published a revision of the *Charities Directory* of 1894. This has been done by municipal authority, the city paying for the printing, while the Associated Charities has provided the office room, the Merchants' Association the typewriting, and Dr. Mary Roberts Smith, of Stanford University, has edited the work.

Hawaii. The Hawaii Charity Organization Society was established March 27, 1899. It has now eighteen affiliated societies. There is comparatively little destitution in the island.

Cuba. Beneficial institutions and hospitals have been reorganized, sometimes renovated and reequipped, industrial and manual training institutions established, and a new law providing for the care of children put in operation. Within the past few months 50 to 60 smaller asylums have been broken up, as the children have

been taken by relatives and friends who are now able to care for them. The Cuban Orphan Society has cared for 777 children since its establishment, November 24, 1900.

Porto Rico. The report of the governor for the year ending May 1, 1901, states that the board of charities created by military rule April 30, 1900, was in existence ten months when it was superseded by an act of the legislative assembly by which a director of charities was appointed by the governor. Under the old board the sanitary conditions of the schools for orphan children were reconstructed, manual training introduced, the insane asylums improved and enlarged, lepers placed in a colony on the Isla de Cabros at the entrance of the harbor of San Juan. The hospitals and asylums are still under municipal control. The governor suggests that they would be better managed by the insular government.

National Conference of Charities and Correction.—The twenty-eighth national conference convened at Washington, May 9-15, 1901, with an attendance of 600 registered delegates. Four sessions of the conference were devoted to a discussion of the care of needy families in their homes, under the chairmanship of Miss Zilpha D. Smith, of Boston. The report of the committee on the care of the feeble-minded and epileptics stated that the general trend of opinion is toward better and more thorough training, more permanent cure, and better classification. Miss Bancroft read a paper with a forcible argument in favor of small private training schools. The session devoted to the public policy in the care of the insane dealt with the question of the manner of commitment, difficulties having arisen with the judicial procedure. Diets were also discussed, the main thought being economy in quantity and quality and the prevention of waste. The revolution in the treatment of the criminal was outlined in the report of the committee on the treatment of crime, which emphasized the principle of the indeterminate sentence, the probation system, the value of a parole law, and the importance of obtaining trained and competent wardens and employees. A resolution was passed expressing the hope that the new prison of the United States at Atlanta will be organized on reformatory principles and its officers be appointed for fitness only. Juvenile reformatories and industrial schools and destitute and neglected children were discussed. At the latter session various plans of supervision were presented and the discussion returned to the old topic—the institution versus the family. The committee on legislation concerning charities made a plea for the establishment by the national government of a bureau of charities and correction for the collection, arrangement, and distribution of statistical and other useful information. The resolution to appoint a committee to secure this legislation did not meet with favor as worded, and a committee was finally appointed to confer with the director of the census in regard to the collection of statistics. The new committee on division of work between private and public charities discussed the question of granting public subsidies to private charities. The committee reported that the practice was widely prevalent, but advocated the complete separation of public and private funds.

State Conferences.—Nineteen State conferences of charities and correction now exist: California, Colorado, Delaware, Illinois, Indiana, Iowa, Kansas, Nebraska, Michigan, Minnesota, Wisconsin, Maryland, New Hampshire, New York, Ohio, Ontario, Oregon, Pennsylvania, and Missouri. None of these conferences is more than ten years old. The California, Kansas, Missouri, New York, and Oregon conferences were added during 1901. These conferences confine their efforts to educational work, although some—Pennsylvania and New Hampshire, for instance—work directly for legislation. They offer an open forum for free discussion. The papers are given by prominent men from without the State, heads of institutions, leading charity workers, college professors, and public officials. A feature of several conferences during 1901 was talks illustrated by stereopticon views. The California conference passed a resolution asking for a probation law. The Ohio conference, which is the largest, showed great interest in the juvenile court. The Minnesota conference held meetings at the State public school and school for blind; an illustrated lecture was given on the child-saving movement, and emphasis was given to the need of amusements for the insane and feeble-minded. The Indiana conference was well organized, with a summary of the work of the board of State charities, an outline of the work of different institutions, and papers on timely subjects. The feature of the Missouri conference was a paper by Hon. James L. Blair, of St. Louis, on *Politics in State Institutions*, in which he criticised the action of the governors of Illinois and Missouri for their partisan appointments of secretaries to the State boards of charities and correction. The Michigan conference, by exhibits of the work of the blind, deaf, and reformatory inmates, endeavored to show what is being done. The New York conference, previous to the November meeting, sent out a circular giving a list of reference books for preparation. A notable programme was prepared and large audiences heard the addresses. At a number of conferences arrangements were made for college and high-school students, as well as the general public, to attend the meetings.

CHATIN, ADOLPHE, French botanist, died January 13, 1901. He was born at Ile-Marianné-de-Saint-Quentin in 1813, and after devoting himself to the study and practice of pharmacy, studied at the University of Paris, where he received the bachelor's degree, and subsequently the degree of Doctor of Science. He graduated in medicine in 1844, and was appointed (1848) professor of botany in the School of Pharmacy, of which he became director in 1873. He retired from this position in 1886, and was made honorary director. In 1874 Dr. Chatin was elected a member of the Academy, and became its president in 1897. He was the author of *Anatomie Comparée*, an exquisitely illustrated work, two volumes of which were published (1856-1862), but which was never completed. In addition to his many studies in plant anatomy, he was the author of *De l'Anthère* (1870) and numerous other works dealing with botanical and chemical subjects. He also published papers on the diseases of potatoes and vines, the cultivation of truffles and other edible fungi, and a book on watercress.

CHAUTAUQUA SYSTEM OF EDUCATION, originated in 1874, has two main divisions of its work: (1) the Chautauqua Scientific and Literary Circle (C. L. S. C.), for the carrying on of home reading during nine months of the year; and (2) the annual assembly at Lake Chautauqua, N. Y.—summer schools six weeks, lectures and entertainments eight weeks, in July and August. The continuous summer school was the first of its kind, and the model on which more than 120 summer assemblies, held in 35 States, have been formed, with an approximate attendance of 1,000,000 persons. In the four-years course of the C. L. S. C., over 260,000 readers have been enrolled since its organization, and over 41,000 have been graduated. These circles now exist in many places outside of the United States. At the conclusion of the four-years' course of reading, special courses of study are outlined for those who wish to continue. There are three grades above that attained by the C. L. S. C. graduate, represented by the Order of the White Seal, which in 1901 had 11,801 members; the League of the Round Table, with 2,569 members; and the Guild of the Seven Seals, with 630 members. The general subjects of the regular four-years' course for 1901-02 (the Italian-German year) are German and mediæval history; United States diplomacy; Roman and Italian life and literature; first steps in human progress. The official organ is the *Chautauquan*, published monthly. The twenty-eighth annual assembly had an attendance of about 50,000 persons in all, the population at any one time being from 12,000 to 15,000. A successful feature of the year 1901 was a new library school. The Hall of the Christ, containing an auditorium, library, and art gallery, all devoted to the study of the Saviour's life, was in course of erection during the summer. A building for the girls' club was planned and an addition to the boys' club was under construction. Important transportation improvements are promised in the near future, including a new railway route to Westfield, a new pier at Point Chautauqua, and a new lake steamer. The *Chautauqua Assembly Herald* was published daily (40 numbers) during the assembly, completing its twenty-sixth volume. The first volume of the *Chautauqua Quarterly*, a 20-page pamphlet, was published during 1901. Chancellor of the Chautauqua system, John H. Vincent; secretary, Ira M. Miller; general offices, Cleveland, O.

CHEMISTRY. In reviewing the progress of chemistry in 1901, there is distinct evidence that the results of the laboratory, when properly interpreted, show a growing tendency to provide the students of this science with more accurate and more comprehensive generalizations. It is also to be observed that the conditions of civilization are more and more demanding the services of chemistry. At a conference in London in December, the neglect of science teaching was deeply lamented, and it was declared that if such teaching had been taken up thirty years ago English industries would have saved millions of pounds. The preëminence of Germany in that respect was referred to as follows. In German factories 10,000 chemists are working, producing ideas that tend to increase the productive power of their country. Germany's success in sugar production is due to the scientific attainments of her workers. Germans prepare the ground slag of a certain steel process as a fertilizer, which is being imported by England. Germans are wonderfully successful in the dyeing industry, and German chemists have discovered a practical process for producing artificial indigo which is injuring the Indian indigo trade. One of the lessons of the Pan-American Exposition was the wonderful utilization of the energy of the Niagara River, and particularly its application to the manufacture of chemical products. It is said that the total capital invested in electro-chemical manufactories all over the world is about \$150,000,000 and the horse power about 400,000. About 65 per cent. of such plants are in the United States, 10 per cent. in Germany, 10 per cent. in France, 2 per cent. in Switzerland, and 1½ per cent. in England. Of more than passing significance was the offer made by the Prussian government of a full professorship of inorganic chemistry in the

University of Göttingen to Dr. Theodore W. Richards, of Harvard University. The offer was accompanied by the assurance that Dr. Richards's duties should consist exclusively of original research and the direction of students of research. The offer was not accepted. The growing recognition of American chemists is perhaps further made apparent by the elevation in 1900 of Frank P. Venable from the professorship of chemistry in the University of North Carolina to the presidency of that institution, and in 1901 by the similar selection of Ira Remsen (*q.v.*) for the presidency of the Johns Hopkins University after a quarter of a century's successful occupancy of the chair of chemistry.

Organizations.—The American Chemical Society, which has now a membership of 1,933 persons distributed among thirteen local sections, held two meetings during the year, the first in Denver, Col., contemporaneously with the American Association for the Advancement of Science, under the presidency of Frank W. Clarke, during August 26-31, when 24 papers were presented; the winter meeting was held in Philadelphia, Pa., during December 30-31, when the titles of 36 papers were presented, of which 30 were read, and President Clarke delivered a retiring address on "The Development of Chemistry," in which he gave a rapid review of the history of that science, and indicated the lines along which progress might be expected in the future. He especially emphasized the desirability of coöperation in chemical research rather than the present method of everyone working in his own specialty independent of others. The chemical section of the American Association was presided over by John H. Long, of Chicago, Ill., who delivered an address on "Some Points in the Early History and Present Condition of the Teaching of Chemistry in the Medical Schools of the United States," in which he urged that the chemistry bearing on the problems of life is worthy of more enthusiastic cultivation in American schools. The New York section of the Society of Chemical Industry held 8 monthly meetings (from October until June), at which 27 papers were read; there was an increase in membership of 108 persons, making a total membership of 871. During the year a canvass was made of persons engaged in electro-chemical industries with a view of organizing an American Electro-Chemical Society, and the announcement has been made that more than 200 names have been received, in consequence of which a preliminary meeting is to be called early in 1902.

Atomic Weights.—No important changes are to be noted under this heading, although much active work has been carried on. In England, Scott has devoted careful study to the atomic weight of nitrogen, but as yet his results do not warrant change in the accepted value. Similarly, Hinrichsen has redetermined the value of calcium, finding it to be 40.14, which is sufficiently near for all practical purposes to the present figures. The atomic weight of tellurium has been the subject of papers by Stiner, Pelini, and Koethner, but they are mainly controversial. Aloy has reported on the value of uranium, but his results will have to be further verified before they can be accepted. Of special promise is Baskerville's work. Besides indicating the incorrectness of the present weight of thorium, his researches seem to show the presence of a new element.

New Elements.—Difficulties in the analyses of complex compounds have frequently led to the discovery of new elements, and such is the case with the announcement of two new elements in 1901. Demarcay, who has devoted much study to the spectrum analysis of certain earths, succeeded in obtaining the sulphate of an earth in sufficient purity to identify it with the hypothetical meta-elements designated as S δ by Crookes in 1885, and as Z ζ by De Boisbaudran in 1892, and he has proposed for it the name of Europium, with the symbol Eu. He obtained it by fractional treatment of magnesium nitrate, and found its line and absorption spectra, electro-fluorescence of the sulphate in vacuo, etc., sufficiently constant and proportional to justify his announcing it before the French Academy of Sciences. Baskerville, of the University of North Carolina, who has devoted during the past five years much attention to thorium compounds, has presented a paper on a "constant unknown impurity" obtained from the mineral monazite from North Carolina, which, should it prove to be a new element, he desires to name Carolinium, with the symbol Cn. Peculiar interest is attached to this paper, as thus far the discovery of a new element has never been accredited to an American chemist.

Physical Chemistry.—The ultimate nature of matter is no nearer solution than in the past, although the work in this new branch of physics "may," said Lord Kelvin in an address before the Chemical Society, "one day be regarded as among the most important of all the new departures in science by which the nineteenth century helped us to understand the world we live in." Many trains of reasoning go to support Thomson's hypothesis that the "corpuscles," as he has called them, which appear to form the cathode, or the Becquerel rays, are almost infinitely smaller than the supposed atoms can be. It is impossible to give any intelligible idea of their size; the mind is incapable of dealing with such notions as that involved in

Bequerel's statement. For example, that in one particular experiment the efflux of material is such that one milligram would disappear from the radiating body in about a thousand million years. A study of the spectrum of a lightning flash, photographed in July, 1901, makes it appear probable, according to E. C. Pickering, that the chemical elements are so-called compounds. Some of the photographs show a doubling of the brilliant lines, and Pickering was at first inclined to believe that it was a sort of composite photograph, but he has since concluded that the doubling looks as though hydrogen, the only element studied in the lightning spectrum, and hitherto believed to be least likely ever to be proved a compound body, is made up of no less than three components. This conclusion he based on the fact that there were thirty lines in the hydrogen spectrum on one photograph, three on another, and one on the third, the different flashes having been photographed in different circumstances. Some doubt has been thrown on the axiom that the weight of substances entering into chemical combination remains the same by certain experiments by Heydweiller similar to those of Landolt, showing that a slight change of total weight accompanies some chemical reactions. It is held, however, that the axiom is not incompatible with variation of total weight in chemical or even physical changes. To obtain the point of absolute zero, which, according to Dewar, is -274° C. or -461° F. and towards the realization of which the researches of that chemist are tending, depends upon the possibility of liquefying helium; and this can only be accomplished by the same process used in the liquefaction of hydrogen, only instead of using liquid air under exhaustion, as the primary cooling agent, liquid hydrogen under exhaustion must be employed and the resulting liquid collected in vacuum vessels surrounded with liquid hydrogen.

Inorganic Chemistry.—Among the advances made during the year may be mentioned the following: A process for making hydrogen was invented by Houbon; it consists of condensing acetylene gas in a Cailletet steel bomb up to five atmospheres and then igniting by electricity. Hydrogen and carbon are set free, the latter being precipitated in the amorphous form as soot. By this method hydrogen can be produced very cheaply, and the process is said to be especially adapted for the inflation of balloons. Ramsay, who has added considerable to our knowledge of the recently discovered elements in the atmosphere, has published the following facts:

	Helium.	Neon.
Density of the gas.....	1.98	9.96
Atomic weight.....	3.96	19.92
Density of the liquid.....	0.3?	1.0?
Index of refraction (gas).....	0.124	0.235

The data for Argon, Krypton, and Xenon are more complete:

	Argon.	Krypton.	Xenon.
Density (gas).....	19.96	40.78	64.0
Atomic weight.....	39.92	81.56	128.0
Density (liquid)	1.212	2.155	3.52
Boiling point.....	-186.1° C	-151.7° C	-109.1° C
Fusion point.....	-187.9° C	-169° C	-140° C
Critical temperature.....	-117.4° C	-62.5° C	$+14.75^{\circ}$ C
Critical pressure	40.20	41.24	43.50
Index of refraction (gas).....	0.968	1.450	2.368

The following table gives the proportions (volumes):

There are 0.937 parts of Argon to 100 of air.

There are 1 or 2 parts of Neon to 100,000 of air.

There are 1 or 2 parts of Helium to 1,000,000 of air.

There is about 1 part of Krypton to 1,000,000 of air.

There is about 1 part of Xenon to 20,000,000 of air.

For comparison it may be recalled that sea water contains only about one part gold in 15,000,000 parts of water.

An electrolytic method for the separation of phosphorous was patented in Germany early in 1901. Phosphoric acid mixed with coke or charcoal is said to be used and the process is a continuous one, requiring no other manipulation than the introduction of new material when the first is exhausted. The remarkable announcement that boron is only a compound of silicon and oxygen was made by F. Fittica; this was not accepted, but may be cited as showing how imperfect is our knowledge of certain elements. Moissan and Lebeau announced their discovery of sulphuryl fluoride, a new colorless gas that boils at -52° C. and melts at -120° C.; they prepared the gas by passing fluorine into an apparatus containing sulphur dioxide, so disposed that the former gas as it reaches the latter is strongly heated by means of a

platinum wire placed at the inner end of the inlet-tube and rendered incandescent by an electric current. The investigation of the electrolytic tension of decomposition of the ammonium salts with a mercury cathode by Coehn and Danneberg has given results perfectly analogous to those obtained with salts of the alkali metals, and experiments carried out under varying conditions to ascertain the possibility of reducing the heavy metals from their solutions, show that the negative results previously obtained are due to the great instability of the ammonium amalgam. By preparing the amalgam electrolytically, at low temperature, it appears to be much more stable, and does not exhibit to any great extent the spongy appearance peculiar to the amalgam under ordinary conditions. These facts seem to settle the much debated question of the existence of an ammonium amalgam in the affirmative. A series of experiments concerning the properties of the rare neodymium chloride were presented by Camille Matignon before the French Academy of Sciences. This same chemist later described in conjunction with Delapine a series of experiments on thorium nitride and hydride, two imperfectly known compounds. M. Tarible described before the French Academy the researches by him that led to the formation of two well-defined crystalline bodies by the combination of boron bromide with the two phosphorous chlorides.

Organic Chemistry.—A painstaking German statistician has estimated that over ten thousand pages are needed to record the annual progress of organic chemistry. In general, work in the newer organic chemistry is in two directions, the one dealing with the ability of a single substance to behave as if it had two or more different structures, or to give derivatives belonging in two or more different classes and known as tautomerism, and the other treating of the chemistry of those elements other than carbon that enter into organic compounds. Titherley has described his experiments showing the tautomerism of the two amides, $C_6H_5C(OH)NH$ and $C_6H_5CO.NH_2$, and McPherson has recently pointed out that the oxyazo compounds seem to be either phenols or quinone-hyrazones according to circumstances. Baeyer and Villiger have announced in the *Berichte* of the German Chemical Society their discovery of diethyl peroxide, which has neither oxidizing nor reducing properties, but is converted into alcohol by reducing agents. Simon, in two papers presented before the French Academy of Sciences, describes the researches which led to his isolation of a new compound tartaric acid that is isomeric with pyrotartaric acid. Its aqueous solution yields an intense violet coloration with ferric salts that is exceedingly delicate. Erysimin is a new glucoside isolated from the seeds of the cruciferous plant *Erysimum aureum*, and is obtained as a pale yellow amorphous compound that is said to be a powerful heart poison. The discovery of a new alkaloid more poisonous than nicotine in tobacco has been announced. An excellent summary of the progress in organic chemistry under the title of *A Review of Some Recent Progress in Organic Chemistry*, is given by Dr. Arthur Lachman in the December, 1901, issue of the *Journal* of the American Chemical Society.

Industrial Chemistry.—The increasing uses of aluminum are noteworthy. That metal seems gradually to be replacing copper as a conductor of electricity, especially for telegraph and telephone wires. In 1889 the production of aluminum in the United States was about 22 tons and in other countries 71 tons, while in 1900 the United States produced about 4,000 tons and other countries about 7,500. Copper wires must be twice as heavy as aluminum in order to do the same work, and 6,000 tons of aluminum used for sheathing or roofs will replace 20,000 tons of copper. The use of aluminum has naturally led to a more careful study of its properties, and in France its rapid oxidation for the purpose of producing very great heat quickly and cheaply has been given the name of aluminothermy. E. Gautier has taken advantage of this property to produce artificial rubies and sapphires by the crystallization of alumina colored with metallic salts, and recommends that process for the purpose of obtaining economically a number of chemically pure metals, such as chromium, manganese, cobalt, titanium, and even iron, without resorting to electric or blast furnaces. A method of obtaining sodium, by submitting a bath containing a mixture of equal molecular weights of sodium and potassium chlorides to the action of the electrolytic current, has been invented by Fischer, and has been found to be successful in yielding sodium containing less than one per cent. of potassium. The manufacture of celluloid by dissolving nitrocellulose in naphthalene instead of in an alcoholic solution of camphor is reported. The use of iron and nickel oxide plates in a solution of potassium hydroxide in place of the lead-zinc plates in sulphuric acid has been announced as the distinctive chemical feature of the storage batteries invented in 1901 by Thomas A. Edison. Maximite is the name of a new explosive invented by Hudson Maxim. Its exact composition is secret, but it is said to be a picric acid compound consisting mainly of a picrate. Its products of combustion are almost entirely gaseous, and as the heat developed on detonation is considerable it possesses as the results of its high gravity a great explosive value. Fieldler has invented an explosive consisting of a fluid and a solid

which will not explode until they are mixed. The former is composed of nitrobenzol, 80 parts, and turpentine, 20 parts, while the solid consists of potassium chlorate, 70 parts and potassium permanganate, 30 parts. To form the explosive, 20 parts of the liquid are added to 80 parts of the solid.

Physiological Chemistry.—The experiments of Frederick G. Novy and Paul C. Freer, of the University of Michigan, have led them to the discovery of the remarkable antiseptic effect of certain organic hyperoxides. They find that these hyperoxides are decomposed on solution in water, and the solution thus formed, even when it contains but .005 of one per cent. of active oxygen, is fatal to all bacteria, and a solution containing .05 of one per cent. of active oxygen kills even the spores. It is claimed that this new preparation, to which the name of Benzozone is given, is an absolute intestinal disinfectant and antiseptic. Its value therefore in such diseases as cholera, dysentery, typhoid fever, and similar intestinal diseases is evident, for by its use the germs would be destroyed at once. M. Eckenberg announces his discovery that the substantial essence of milk can be reduced to a fine powder. If this powder be dissolved in a certain quantity of water it becomes again ordinary milk, with all its nutritive qualities, its tastes, and smell. It appears that it is now possible to obtain a definite reaction from blood-stains, however old, which indicate with something approximating absolute certainty the source of the blood under examination. This result, discovered independently by Dr. Uhlen-Luth, of Greifswald, and Dr. Wassermann and Dr. Schutze, of Berlin, is based on the fact that the blood-serum of animals which have been injected with the blood of an animal of a different species, when added to a dilution of blood from the latter, produces therein a well-marked precipitate.

Among the better known chemists who died during 1901 are Charles Chauncey Parsons (January 16), a manufacturing chemist in Brooklyn, N. Y., and an active member of the American Chemical Society; Stevenson Macadam (January 24), long professor of chemistry at the Edinburgh School of Medicine; Max von Pettenkofer (*q.v.*) (February 10), professor of hygiene in the University of Munich, president of the Bavarian Cholera Commission in 1873, and an accepted authority on hygiene and sanitary chemistry; Maurice Perkins, professor of chemistry, from 1865 till his death, at Union College, Schenectady, N. Y.; Waldron P. Shapleigh, distinguished for his work among the rarer earths, especially neodymium and praseodymium; and Sir Joseph Henry Gilbert (*q.v.*) (December 23), sometime Sibthorpean professor of rural economy in the University of Oxford, and a large contributor in the domain of agricultural chemistry, chiefly with Sir John B. Lawes.

CHENEY, PERSON COLBY, former governor of New Hampshire, died at Dover, N. H., June 19, 1901. He was born at Holderness, N. H., February 25, 1828, and received an academic education. He served in the Civil War in the Union army, and was elected to various State offices until 1875, when he became governor of New Hampshire. In 1886 he was elected to fill the unexpired term of United States Senator Pike. In 1892-93 he was United States minister to Switzerland. From 1892 until his death he was a member of the Republican national committee.

CHESS. The most important American tournament of 1901 was played at Buffalo, and was won by H. N. Pillsbury, 8 games out of 10, with Delmar second and Napier third. British and American teams of 10 contested by cable for the Newnes trophy, each side winning and losing 5 games. The intercollegiate-international cable contest between an Oxford-Cambridge six and six of Columbia-Harvard-Princeton resulted in each side winning 2, losing 2, and drawing 2 games. The United States intercollegiate championship was won by Columbia, 8½ games won and 3½ lost, with Princeton and Yale second and Harvard third. Cornell won in the triangular contest with Brown and the University of Pennsylvania. The latter won from Yale and Yale beat Brown. The international masters' tournament at Monte Carlo brought together fourteen of the world's great players. Janowski, of Paris, won 10¼ and lost 2¼; Schlechter, of Vienna, 9½-3½; Tschigorin, of St. Petersburg, 9-4; Scheve, of Berlin, 9-4; Alapin, of St. Petersburg, 8½-4½; Mieses, of Berlin, 7-6; Blackburn, of London, 6½-6½; Gunsberg, of London, 6¼-6¼; Marco, of Vienna, 6-7; Marshall, of New York, 5½-7½; Reggio, of Rome, 4¾-8¾; Mason, of London, 4½-8½; Winawer, of Warsaw, 4-9; and Didier, of Paris, ¼-12¾.

CHICAGO, UNIVERSITY OF, at Chicago, Ill., founded 1890. President, William Rainey Harper, LL.D. The university celebrated its tenth anniversary in June, 1901, by devoting a week to educational conferences, corner-stone laying, and numerous and extensive social functions. The founder, Mr. John D. Rockefeller, for the second time in its history, visited the university and participated in the celebration. The buildings for which corner stones were laid and which are in process of erection, with the estimated cost, are as follows: Heat and power plant, \$150,000; University Press building, \$100,000; Hitchcock hall, \$150,000; group of buildings, \$400,000; School of Education building, \$435,000; Bartlett gymnasium,

\$210,000; temporary building (School of Education), \$24,000. The completion of these will increase the number of buildings on the campus to twenty-five, and will provide an addition of 70 per cent. to the room space furnished by the present buildings.

At the convocation exercises on June 18, honorary degrees were conferred on eleven men from various parts of the world who have done distinguished service in various fields of activity. Prior to this time only one honorary degree had been granted by the university—that was to William McKinley in 1899.

The absorption by the university of the Chicago Institute, recently founded by Mrs. Emmons Blaine, and the gift of \$1,000,000 to this new school, "The University of Chicago School of Education," by the founder, forms one of the valuable gifts to the institution for the year 1901. To this school will be joined the South Side Academy, an affiliated preparatory school, and the Chicago Manual Training School, a preparatory school of technology. The faculties of these various schools become members of the university staff.

The transfer of the freshman and sophomore classes of Rush Medical College to the university has increased the attendance by 230. This transfer did not affect the relation of the college and the university, the former being still only an affiliated school. The requirements for admission were materially raised by the transfer.

During 1901 the university received gifts, in the form of buildings and endowments, amounting to more than \$4,000,000. According to President Harper's quarterly statement of December 18, the general assets of the university for the year closing June 30, 1901, were as follows: Investments, \$7,603,691.55; buildings, \$2,207,366.71; grounds, \$1,244,067.53; cash and current assets, \$482,761.36; books, \$292,507.51; scientific equipment, \$391,700.81; furniture, \$66,228.09; material and supplies, \$66,137.22; printing-office plant, \$9,755.80; total, \$12,364,216.58; gifts received after June 30, \$1,628,437; total, \$13,992,653.58. The rate per cent. of income on the investments, which are divided among real estate, bonds, and stocks, for 1901 was 4.44 per cent. The current expenses for the year amounted to \$790,583.68. Of this amount \$410,750.50 were expended for instruction; \$69,357.85 for scholarships and fellowships; and \$26,915 for books. Of the receipts for the year the students' tuition bills furnished 41.2 per cent. and the investments 27.5 per cent.

The enrollment of students for the autumn quarter increased from 594 in 1892 to 2,431 in 1901. The freshman class, which in 1892 numbered 151, in 1901 numbered 444. The total enrollment in the elementary and secondary schools under the direct charge of the university numbered 869. The university has 291 names on the list of officers of instruction and administration. The statistics show an increasing proportion of women in the university each year. In 1900-01 there were 1,399 men and 1,247 women. President Harper has declared the policy of the university to be in favor of co-education. He says co-education is a permanent feature of higher education in the West, and that within a few years it will be so in the East. The four-quarter system, peculiar to the University of Chicago, was modified by closing all work on August 31, and thus giving one month's vacation. This was done to meet the demands of the large body of teachers who desire to attend during the summer quarter, but are compelled to leave by September 1. The change is likely to be a permanent one.

The history department has been strengthened by the appointment of Professor J. F. Jameson, formerly of Brown University, and editor of the *American Historical Review*, to the head of the department, and by the addition of \$25,000 worth of books to the historical library. The university has bought real estate, until now it owns the greater part of eleven blocks, five of which front on the Midway Plaisance between Ingleside Avenue and Monroe Avenue.

Plans are under consideration for the organization of a college of commerce and administration. Courses are already being offered in this college, but a separate faculty has not yet been organized. Arrangements have been made for a course of lectures extending through the entire year, to be delivered by prominent business men, acknowledged authorities in their respective fields.

The university senate has planned a series of publications which will set forth the intellectual growth of the first ten years of educational work. These memorial publications will constitute the president's report to the board of trustees, and will comprise ten volumes. These volumes will consist of the reports of heads of departments, scientific publications of members of the faculty, doctors of the university, and graduate students. Doctors' theses will be an important part of the work. The last eight volumes will consist of unpublished articles of a strictly scientific nature, under the general title of *Investigations*.

CHILDREN'S AID SOCIETY, organized in 1853 for the education of poor children, housing them in lodging houses, and procuring homes for them when desirable in rural districts. The society has provided houses and places of employment, since its organization, for 77,000 boys and girls and instruction to over

115,000, besides maintaining seven lodging houses for boys and girls respectively, under competent superintendents in various parts of New York City. The society in addition provides summer homes, a sick children's mission, a farm training school, a public laundry, and free reading rooms in the various lodging houses. Income for 1900: Received from city, \$155,176; from private contributors, \$128,990; from other sources, \$98,369—total, \$382,536. President, D. Willis James; secretary, C. L. Brace, United Charities Building, New York City.

CHILE, a South American republic extending along the Pacific coast from Peru to Cape Horn. The capital is Santiago.

Area, Population, etc.—The area of the twenty-three provinces and one territory comprising Chile is estimated at 266,652 square miles. The boundary dispute with Argentina, referred to the arbitration of representatives of the British government, had not been settled in 1901. The estimated population, exclusive of the Indians, who probably number about 50,000 was 3,110,083 on January 1, 1900. At the same time the estimated populations of Santiago and Valparaiso were 320,638 and 143,022 respectively. Immigration, though encouraged by the government, is small; from 1857 to 1897 the total number of immigrants was only 38,528, as against 2,275,521 to Argentina. The state religion is Roman Catholicism. There is a system of public education, including primary, secondary, higher, and professional instruction. The public primary schools in 1900 numbered 1,403, with an enrollment of 113,863 pupils and an average attendance of 72,690; in 1901 the public primary schools numbered 1,547. In the latter year about 9,000,000 pesos currency were appropriated for public instruction. There are various private schools.

Government.—The chief executive is a president, who is assisted by a council of state and by a ministry, which is responsible to the congress. On September 18, 1901, Señor Jerman Riesco was inaugurated president for the term ending in September, 1906. The legislative body is a congress consisting of a senate and a chamber of deputies.

The standing army in 1901 was fixed at a maximum of 17,385 men. The navy comprised 16 war vessels, 20 torpedo boats, 10 coast-guard vessels, 2 transports, and 10 pontoons or store vessels; the personnel comprised 5,260 men.

Finance.—Nominally the monetary standard is gold, and the unit of value is the peso, worth 36.5 cents in United States money. On July 30, 1898, the president was authorized to issue 50,000,000 pesos in paper, the conversion of which was to begin on January 1, 1902; in November, 1901, the government submitted to the congress a measure for the postponement of this conversion until October, 1903.

The largest item of revenue is export duties (chiefly on nitrate), import duties ranking next; by far the largest expenditure is interest on the public debt. The revenue and expenditure for the fiscal year 1899 were estimated at 100,572,937 pesos and 94,506,313 pesos respectively; in 1900, revenue 126,037,873 pesos and expenditure 112,708,571 pesos. The estimated revenue reported for 1901, including a surplus from the preceding year, was 123,104,051 pesos, and the authorized expenditure 129,319,793 pesos. It was stated, however, that this proposed expenditure would be scaled down to conform to the receipts. The customs receipts have been: 1899—on exports 47,245,169 pesos, on imports 21,368,586 pesos, total 68,613,755 pesos; 1900—on exports 50,161,598 pesos, imports 28,305,863 pesos, total 78,467,461 pesos. Of the export revenue in the latter year 49,679,017 pesos were duties on nitrate. At the beginning of 1900 the external debt amounted to £17,571,706, or 234,289,413 pesos; and the internal debt, including municipal debts, 75,964,770 pesos—total 310,254,183 pesos.

Industries and Commerce.—The principal industries are agriculture and mining, while stock-raising is of some importance. The most important single article produced is nitrate of soda. The production of this fertilizer in 1899 amounted to 31,312,580 Spanish quintals (1,443,201 metric tons), and in 1900 to 32,474,583 Spanish quintals (1,493,807 metric tons). An agreement entered into by the nitrate producers in November, 1900, and going into effect on April 1, 1901, fixes the maximum annual production at 30,500,000 quintals.

The imports and exports in 1891 amounted to 134,445,555 pesos and 138,703,823 respectively; in 1899, 106,260,358 pesos and 163,106,133 pesos respectively; in 1900, imports 128,812,115 pesos (\$46,916,422) and exports 167,674,636 pesos (\$61,201,242). In the last two years the exports of coin included in these figures were 2,595,577 pesos and 15,328 pesos respectively. A considerable decrease in imports in 1898, 1899, and 1900 was largely due to the economic crisis through which the country passed in 1898, and to the law that became operative on January 1 of that year, changing the custom duties. The leading imports in 1900 included: Coal (13,494,900 pesos), cotton and woolen goods, iron and ironware, and sugar (6,518,105 pesos).

The total reported mineral export in 1898 was valued at 126,742,641 pesos, and in 1899 at 137,637,603 pesos. The principal items included in the latter figure were: Nitrate, 1,380,718 metric tons, valued at 96,650,282 pesos; copper in various forms,

18,567,716 pesos; iodide, 4,108,427 pesos; silver, 3,778,175 pesos; gold, 2,461,234 pesos. In 1900 the articles classified as mining products were valued at 151,626,206 pesos; agricultural, 14,705,822 pesos; and articles re-exported, 1,343,607 pesos. The values of the principal exports in 1900 were: Nitrate, 31,549,653 quintals, valued at 109,945,156 pesos; copper in various forms, 23,016,468 pesos; iodide, 4,043,172 pesos; coal, 3,909,460 pesos; gold, 2,806,698 pesos; silver, 2,499,116 pesos. For the ten years, 1891-1900, the nitrate exported amounted to 876,813,238 pesos and the iodide 63,338,947 pesos. Of the nitrate exported, about 39 per cent. goes to Germany, 17.3 per cent. to France, 13.3 per cent. to the United States, 11.2 per cent. to Great Britain, and 10.9 per cent. to Belgium.

Great Britain stands first in the foreign trade, the imports from and the exports to that country in 1899 amounting to 44,338,050 pesos and 110,528,378 pesos respectively; Germany was second, sending goods to the value of 29,748,898 pesos and receiving to the value of 20,921,999 pesos; the United States, France, and Peru followed in the order named. In 1900 33.05 per cent. of the imports came from Great Britain, 26.70 per cent. from Germany, 9.41 per cent. from the United States, 7.24 per cent. from Australia, 7.22 per cent. from France, and 5.22 per cent. from Peru.

Communications.—The economic development of Chile, like that of all South American countries, is retarded by inadequate means of transportation. In 1901 there were 4,486 kilometres (2,787 miles) of railway lines, of which 2,186 kilometres (1,358 miles) belonged to the state. At the same time there were a number of lines in process of construction or survey. In the budget for 1901 about 23,000,000 pesos currency were appropriated for the construction and improvement of railways. On August 23, 1901, the Chilean hypothecary creditors of Clark's Transandean Railway (Chilean section) sold their rights to the Transandean Construction Company, Limited, for \$437,985; it was stated that for the settlement of various other interests involved an additional sum of \$535,315 was expended. It was thought that this transaction afforded "a guarantee for the speedy completion of this very important line of communication."

This line, when completed, will connect Valparaiso with Mendoza in Argentina. Of the 44 miles in Chilean territory, 18 have been completed. The Argentine section is 110 miles long; of these 89 miles were open for traffic at the end of 1901, 11 were nearly ready, while the roadbed of the remaining 10 miles was almost completed.

Events of 1901.—In March, 1901, the cabinet resigned. Señor Amunátegui Rivera, who had been minister at Montevideo, formed a Liberal ministry, which he said proposed to observe neutrality in the presidential election. Thereupon the chamber of deputies passed a vote of censure "on the ground that the cabinet was not sufficiently representative of the Liberal majority in congress." Señor Jermain Riesco had already been nominated as a Liberal for president, in opposition to Señor Pedro Montt, who was supported by the Conservatives and a faction of the Liberal party.

After a prolonged ministerial crisis a new cabinet was formed late in April, with Señor Aníbal Zanartu as premier and minister of the interior, and Señor Augusto Orrego Luco as minister for foreign affairs. Disorders in connection with the presidential election occurred in June at Valparaiso, Concepción, and Antofagasta. At the last-named place a procession of Señor Riesco's supporters was fired upon by the police, three persons being killed and others wounded. In the presidential election of June 25, Señor Riesco, who favored a sound currency, was successful. He was inaugurated on September 18. Meanwhile Señor Federico Errázuriz (*q.v.*), who had resigned the presidency (May 1) on account of ill-health, died on July 12. The vice-president and premier, Señor Zanartu, had assumed the executive functions, but resigned on September 2, and Señor Ismael Tocornal, who had become minister of foreign affairs, acted as chief executive for the remaining days of the term. A new cabinet was formed under Señor Barros Luco on September 11. It is stated that during the presidency of Señor Errázuriz Chile had more than thirty cabinets. On July 18 Señor Arias Sanchez, the Ecuadorian consul-general, was assassinated in Valparaiso.

In January, 1901, it was announced that the so-called Billingshurst-Latorre protocol, which was signed some two years before to provide for the manner of taking a plebiscite on the Tacna-Arica question, had been rejected by the Chilean chamber of deputies after passing both houses of the Peruvian congress and the Chilean senate. See SOUTH AMERICA.

The Argentine-Chilean boundary dispute, which, in pursuance of the agreements of April, 1896, and September, 1898, was given over to the arbitration of a British commission and which at the close of 1901 was still pending settlement, has been one of several causes that have brought a feeling of unfriendliness between the two republics. Consequently a new dispute, not within the jurisdiction of the British commission, arising in the fall of 1901, was attended by particularly bitter protests

from both governments. The territory in dispute was Ultima Esperanza, which lies between 51° and 52° south latitude and touches Worsley Bay, an inlet of the Pacific. This district, though in itself comparatively petty, is of considerable strategic importance, commanding to a certain degree the Strait of Magellan. The dispute arose from the fact that Chile, desiring to establish neutral roads in the district, attempted to drive out the Argentine police. Immediately friction became serious and the mobilization of the reserves of the two republics was begun. Late in December Chile proposed as a basis of settlement that she disavow all intention of treating her roads in the territory as evidence of previous rights of possession, and that Argentina withdraw from the doubtful territory all her officials. Argentina of course accepted the first clause of this proposal, but rejected the second. When both governments were on the point of breaking off diplomatic relations, they arrived at a settlement, temporary at least, in a protocol signed December 26, submitting the question to the arbitration of the British commission mentioned above. It must be pointed out, however, that Chile seems determined at any cost to keep Argentina away from Pacific waters. The boundary commission decided to send Sir Thomas Hildich, one of its members, to examine the geographical conditions of the territory in dispute.

CHINESE EMPIRE, an Asiatic monarchy lying between Siberia on the north and French Indo-China and British India on the south. The capital is Peking.

Area and Population.—According to the latest estimates the total area is placed at 4,234,910 square miles and the population at 399,680,000. These totals are made up as follows: China proper (the "middle kingdom" or "the eighteen provinces"), 1,353,350 square miles and 383,000,000 inhabitants; Manchuria, 362,310 and 7,500,000; Tibet, 651,500 and 6,000,000; Mongolia, 1,288,000 and 2,000,000; Jungaria, 147,950 and 600,000; East Turkistan, 431,800 and 580,000. At the beginning of 1900 the foreigners in China, about half of whom resided at Shanghai, numbered 17,193; of these 5,562 were British, 2,440 Japanese, and 1,621 Russian. See table in paragraph Commerce.

The three principal religions are Confucianism, the state religion, with the emperor as the supreme head, Taoism, and Buddhism, which has the largest number of adherents. Many of the people have mingled the three religions, and ancestor worship, which is particularly a feature of Confucianism, prevails throughout the empire. There are said to be about 30,000,000 Mohammedans, 1,000,000 Roman Catholics, and 50,000 Protestants. A small degree of education is general, but higher education, consisting chiefly of moral philosophy and classic Chinese literature, is given only to the class known as the *literati*. Theoretically any Chinaman, by passing the prescribed examinations, may be admitted to this class.

Government.—Governmental administration is carried on, under the emperor, by various councils or boards. The imperial authority is not hereditary, but descends according to custom to some member of the royal family of a younger generation, through appointment by his predecessor. The emperor in 1901 was Kwang Hsu, ninth ruler of the Manchu dynasty of Tsing, who succeeded the Emperor Tung-chi by proclamation in 1875. Kwang Hsu, belonging to the same generation as Tung-chi, who did not name a successor, was selected by the empress dowager, Tszu-Hszü, who acted as regent till 1887. In September, 1898, the empress dowager caused Kwang Hsu to give over to her the imperial authority, and since that time she has practically been the head of the state. The fact that Kwang Hsu is not of a younger generation than his predecessor was of some aid to the empress dowager when, on January 24, 1900, she named Pu Tsing, son of Prince Tuan, as the true successor of Tung-chi. On November 30, 1901, however, this appointment was rescinded. Kwang Hsu has never ceased to be regarded as the emperor. During the disturbances of 1900 the imperial court withdrew to Si-gnan-fu; it approached Peking at the end of December, 1901. Each of the eighteen provinces of China proper is governed by a viceroy, responsible to the imperial government.

Army and Navy.—The principal parts of the Chinese military forces are the "Eight Banners," largely Manchus, and the Ying Ping (the "Green Flags"), or national army. The first has nominally 300,000 men, of whom 80,000, or perhaps 100,000, are kept on a war footing. The second, which is scattered throughout the eighteen provinces, has a nominal strength of 540,000 or more men, of whom about 200,000 are available. The total army on a peace footing has been estimated at 300,000 men and on a war footing at 1,000,000 men. Before the outbreaks of 1900 a British army officer estimated the number of "fighting troops" at 205,000 and "reserves under arms" at 689,000. Discipline and equipment have been very poor, but since 1898 the government has endeavored to improve the army's effectiveness by the introduction of European methods and arms; this improvement continued in 1901, and in that year also the Chinese factories turned out large amounts of arms and ammunition for the troops. The navy consists of four armored cruisers, three small cruisers, a torpedo cruiser, and a torpedo boat.

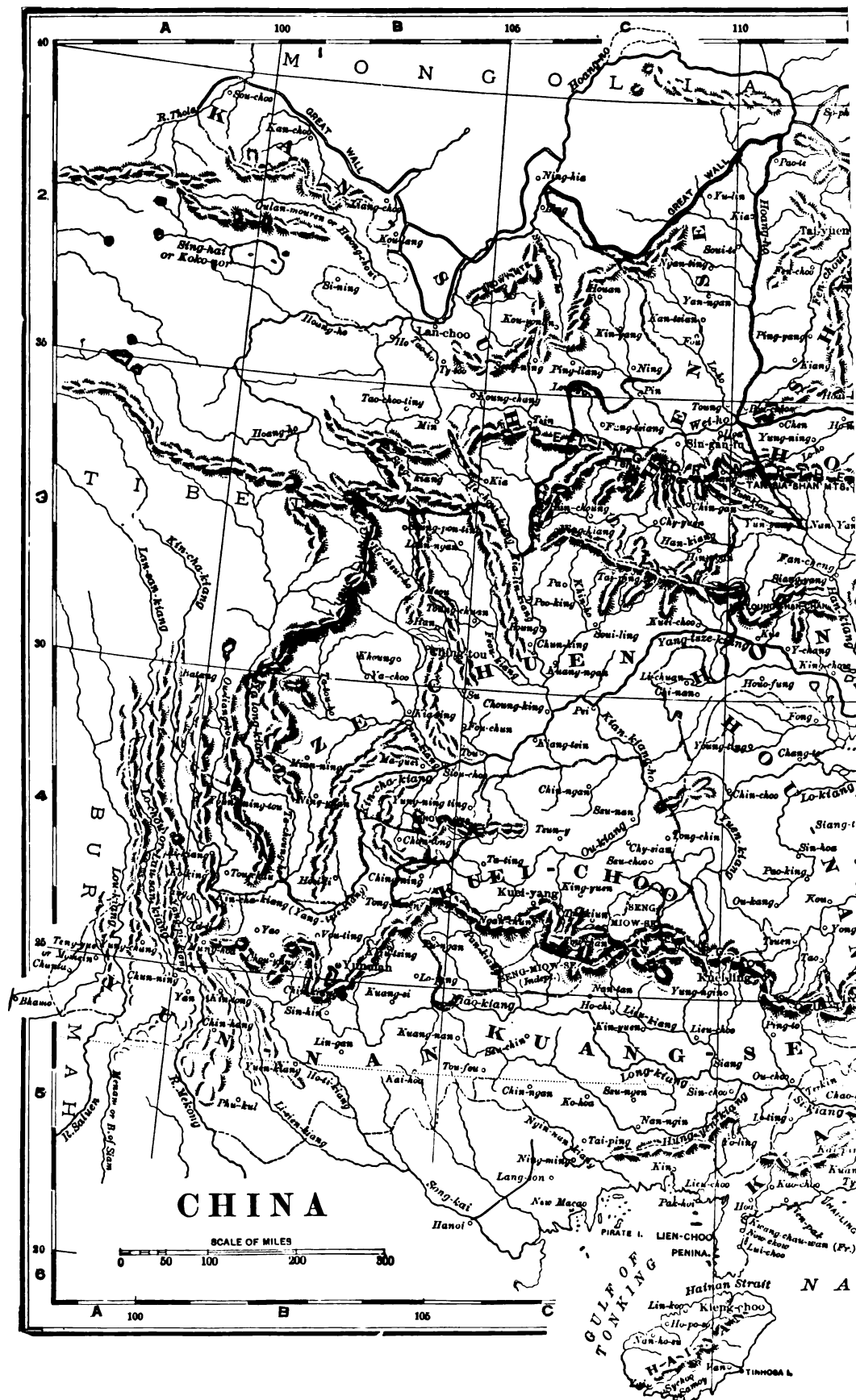
Finance.—The Chinese government makes no complete statements of finance, but

the annual revenue and expenditure are unofficially estimated at from \$60,000,000 to nearly \$75,000,000. The largest sources of revenue are the foreign maritime customs (under British management), about \$12,000,000, and the land tax, about \$14,000,000; and the largest expenditures are for service of the debt, war, and provincial administration. (For customs receipts see table in paragraph Commerce.) In 1900 the outstanding foreign debt amounted to about \$262,790,000. As a result of the negotiations with the Powers in 1901, the debt was increased by an indemnity amounting to 450,000,000 haikwan taels, or \$333,900,000, the value of the tael being fixed by the negotiators at 74.2 cents. Accordingly, the total foreign debt may be placed at about \$596,690,000.

Commerce.—Foreign commerce passes through thirty-four treaty ports and is supervised by the imperial maritime customs, which since 1885 have been under the direction of Sir Robert Hart. The report issued by this bureau for 1900 contains the latest available figures of commerce for a full calendar year. The year 1899 showed the largest trade returns on record, and the early months of 1900 were indicative of continuing prosperity. Then came the Boxer outbreak, for a few months almost annihilating commerce in the north and disturbing trade conditions throughout the country. Later, however, reaction set in and the year ended with considerable promise. Indeed, a much greater falling off in trade than actually took place might reasonably have been expected. "That trade was not more ruinously impeded," wrote the American secretary of legation at Peking, "always excepting the actual area of hostilities, during a year which was so exceptionally trying to merchants and so full of unrest for the populace, shows its vitality and how quickly it will revive when peace is restored." Notwithstanding the unfavorable conditions in 1900, the imports for that year slightly exceeded those for 1898, while the exports fell below the latter year by only about 3,849,000 haikwan taels. The values assigned to imports and exports are the actual market prices in the Chinese ports; the true values, therefore, are for the imports the value "at the moment of landing" and for the exports the value "at the moment of shipping." That is, from the reported value of imports should be deducted the import duty and expenses of landing, storing, etc.; and to the reported value of exports should be added the export duty, the importer's commission, and expenses of shipping, etc. When such subtractions and additions are made, the value of imports for 1899 becomes 233,953,853 haikwan taels and of the exports 217,610,004 haikwan taels; while for 1900 the values become about 185,870,000 haikwan taels for imports and about 176,680,000 haikwan taels for exports.

The table given herewith shows the market value of trade, exclusive of bullion, by countries, in haikwan taels and equivalent United States gold, as reported by the maritime customs for 1899 and 1900. It should be stated, as the United States

COUNTRY.		1899.		1900.		TOTAL TRADE.	
		Imports.	Exports.	Imports.	Exports.	1899.	1900.
United States.....	hk. taels	22,288,745	21,685,715	16,724,498	14,751,631	43,974,480	31,476,124
	dollars.	16,069,041	15,624,558	12,053,342	10,631,500	31,683,599	22,684,842
Great Britain.....	hk. taels	40,161,115	13,962,547	45,467,408	9,356,428	64,123,662	54,823,837
	dollars	28,936,083	10,060,014	32,768,362	6,743,178	38,996,097	39,511,540
Continent of Europe, except Russia.....	hk. taels	10,172,398	36,763,506	10,273,406	24,976,619	46,935,804	35,250,024
Russia, including Asiatic Russia.....	hk. taels	7,329,213	26,488,106	7,404,043	18,000,649	33,817,319	25,404,692
	dollars	3,233,239	15,331,186	4,236,507	7,222,733	18,564,425	11,469,240
Japan and Formosa.....	hk. taels	2,229,549	11,046,120	3,053,251	5,206,424	13,275,669	8,258,675
	dollars	35,896,745	17,251,144	26,782,694	16,988,063	53,147,889	42,690,747
Hong-Kong.....	hk. taels	25,863,606	12,429,449	18,659,967	12,207,254	36,293,064	30,767,221
	dollars	118,096,208	71,846,558	93,846,617	63,961,634	189,941,766	167,808,251
India.....	hk. taels	85,068,318	61,764,725	67,635,257	46,097,150	136,863,043	112,732,407
	dollars	31,911,214	1,731,498	16,813,029	2,865,345	33,642,712	19,678,374
Straits Settlements.....	hk. taels	22,992,030	1,247,544	12,117,150	2,065,064	24,239,574	14,182,204
	dollars	3,646,196	2,231,792	2,625,258	2,435,355	5,877,967	5,060,613
Russian Manchuria.....	hk. taels	2,627,063	1,608,006	1,892,023	1,765,180	4,236,069	3,647,183
	dollars	269,165	3,225,806	136,966	6,151,392	3,514,971	5,288,338
Macao.....	hk. taels	208,343	2,324,093	98,704	3,712,601	2,532,436	3,811,305
	dollars	3,408,516	5,824,487	2,236,289	4,710,359	9,233,038	6,946,648
Philippine Islands.....	hk. taels	2,455,836	4,196,543	1,611,693	3,394,756	6,652,378	5,006,449
	dollars	21,641	61,629	12,815	113,831	83,270	126,646
Other countries.....	hk. taels	15,592	44,404	9,236	82,038	59,996	91,274
	dollars	841,850	2,496,982	1,237,413	2,604,610	3,338,832	3,842,023
	dollars	606,538	1,799,076	891,804	1,877,142	2,405,614	2,768,946
Total.....	hk. taels	269,957,031	192,411,850	219,363,285	155,187,980	462,363,881	374,551,265
	dollars	194,411,225	138,632,638	158,094,632	110,771,906	333,045,863	268,866,538



consul-general at Shanghai has pointed out, that "the customs credit the trade to the country from which and to which the carrying ship clears, without taking any note of the country in which the goods originated or for which they are destined." For example, goods shipped via Hong Kong are credited to Hong Kong, via London to Great Britain, via Japan to Japan, etc.

The reported value of the imports of cotton goods fell from \$74,457,406 in 1899 to \$54,519,603 in 1900. Some of the principal items included in these totals were, for 1899 and 1900 respectively: Indian yarn, \$26,205,428 and \$13,847,900; Japanese yarn, \$12,177,203 and \$7,239,082; gray shirtings, \$8,108,850 and \$8,116,424; white shirtings, \$5,838,728 and \$5,704,660; American sheetings, \$6,924,070 and \$4,494,469; American drills, \$3,037,631 and \$1,694,711; lastings, \$2,386,797 and \$3,636,661; T cloths, \$1,675,166 and \$1,247,366; English sheetings, \$1,364,302 and \$1,157,161. Other leading imports were valued in 1899 and 1900 respectively: Opium, \$25,788,689 and \$22,366,905; woollen goods, \$3,008,550 and \$2,466,700; raw cotton, \$2,504,299 and \$1,321,019; machinery, \$1,099,879 and \$1,045,081; tin in slabs, \$1,054,856 and \$1,374,128; American kerosene, \$4,684,539 and \$4,543,570; Russian kerosene, \$3,524,239 and \$3,710,183; Sumatran kerosene, \$858,906 and \$1,804,035.

The movements of gold and silver bullion recorded by the customs between China and foreign countries in 1900 showed a net import of gold worth 1,202,315 haikwan taels (\$866,508) and a net import of silver worth 15,442,212 haikwan taels (\$11,129,202). Large amounts of British, French, and Mexican silver coin were brought by the foreign military. It was reported in 1901 that in Manchuria dollars were taking the place of sycee as currency.

China's most valuable export—raw and manufactured silk—which amounted to \$59,195,781 in 1899, seriously decreased in 1900. The crop was satisfactory, but the anticipated consumption resulting from the Paris Exposition was not fully realized, while "overproduction in Europe and America caused a weak demand and low prices," and at the same time Japanese competition was severe. In 1901 there was little prospect of an immediate improvement in the silk market. The export ranking second in value is tea. In 1885 the shipments amounted to 283,833,800 pounds; the export fell to 204,286,700 pounds in 1897, increasing slightly in the following year, and in 1899 reached 217,439,300 pounds. In 1900 the shipments declined to 184,382,110 pounds. The last amount was made up as follows: Black tea, 115,016,533 pounds; brick, 42,245,836; green, 26,716,652; tablet, 403,089. Of raw cotton nearly 95,000,000 pounds were exported in 1900, and the exportations of hides, horns, tallow, oils, nutgalls, rush hats, and straw braid increased.

Some idea of the relative importance of foreign trade carried on at each treaty port may be gained from the following table, which states in American gold the imperial customs revenue for 1899 and 1900; the total amounts, \$19,209,582 and \$16,485,281 for the two years respectively, correspond to 26,661,460 haikwan taels and 22,873,985 haikwan taels, the figures reported by the customs.

PORTS.	Provinces.	REVENUE.		PORTS.	Provinces.	REVENUE.	
		1899.	1900.			1899.	1900.
Amoy.....	Fokien.....	\$551,737	\$479,863	Ningpo.....	Chekiang.....	\$577,027	\$494,533
Canton.....	Kwangtung.....	1,452,722	1,303,696	Niuchwang.....	Fengtien (Man- churia).....	669,157	359,085
Chifu.....	Shantung.....	491,160	401,331	Pakhol.....	Kwangtung.....	124,930	97,896
Chinkiang.....	Kiang-su.....	667,425	642,175	Samshui.....	Kwangtung.....	81,861	71,356
Chungking.....	Sechwan.....	334,460	271,632	San-to-ao.....	Fokien.....	3,093	55,968
Fuchau.....	Fokien.....	1,054,532	856,437	Semao.....	Yunnan.....	5,749	4,877
Hangchow.....	Chekiang.....	429,989	385,334	Shanghai.....	Kiang-su.....	5,851,069	5,151,481
Hankow.....	Hupe.....	1,728,438	1,624,828	Shaohi.....	Hupe.....	3,808	4,772
Ichang.....	Hupe.....	417,638	648,902	Suchow.....	Kwangtung.....	41,327	26,579
Kaulun.....	Kwangtung.....	276,017	252,263	Swatow.....	Kwangtung.....	1,136,309	1,064,372
Kiao-Chau.....	Shantung.....	22,615	42,869	Tientsin.....	Chili.....	914,894	372,391
Kiukiang.....	Kiang-si.....	711,692	634,347	Wenchow-fu.....	Chekiang.....	48,526	29,605
Klung-chou-fu.....	Kwangtung.....	144,923	118,716	Wuchow.....	Kwang-si.....	212,263	218,639
Koumfun and Kumchuk.....	Kwangtung.....	24,560	29,104	Wuhu.....	An-hwai.....	687,160	644,397
Lappe.....	Kwangtung.....	314,778	480,767	Yatung.....	Tibet.....	.....	.....
Lung-chou-fu.....	Kwang-si.....	2,179	3,634	Yuchow-fu.....	Hunan.....	.....	570
Mengtau-hsien.....	Yunnan.....	129,617	129,107	Total.....		\$19,209,582	\$16,485,281
Nanking.....	Kiang-su.....	40,819	106,267				

According to a statement appearing in the United States consular reports under date of April 4, 1901, the foreign firms and residents in China were as follows:

Nationality.	Firms.	Residents.	Nationality.	Firms.	Residents.
British	424	5,471	Italian	9	133
Japanese	212	2,900	Dutch	9	108
German	120	1,343	Spanish	8	221
French	82	1,054	Austrian	7	91
American	81	1,908	Swedish and Norwegian	4	204
Russian	21	1,941	Danish	3	156
Portuguese	16	1,175	Korean		42
Belgian	10	100	Non-treaty powers		34
			Total	1,006	16,881

The Boxer uprising of 1900 almost destroyed, temporarily, foreign trade in northern China. Since this part of China is practically the field of American trade, perhaps no country in the world suffered more than did the United States. The year 1900 began with the greatest increase in American trade in China on record, and "ended with the most serious losses." The greatest American loss was in piece goods and in kerosene. Some idea of the disastrous effects on trade of the Boxer outbreak may be gained from the following figures comparing the amounts of American importations at the three northern ports of Chifu, Tientsin, and Niuchwang for quarters ending June 30 and September 30 in 1899 and in 1900. The first table relates to quarters ending June 30 and the second to quarters ending September 30.

Article.	1899.	1900.	Increase.	Decrease.
Jeans (pieces)	25,885	14,270	.....	11,615
Drills (pieces)	504,578	219,398	.....	285,180
Sheetings (pieces)	1,051,805	1,052,635	.....	599,170
Kerosene (gallons)	2,339,040	3,544,530	1,205,490	.....

Article.	1899.	1900.	Increase.	Decrease.
Jeans (pieces)	22,930	3,340	.....	19,590
Drills (pieces)	371,172	20,589	.....	350,583
Sheetings (pieces)	839,480	81,790	.....	757,690
Kerosene (gallons)	2,053,100	50,000	.....	2,003,100

The increase of the kerosene import for the quarter ending June 30, 1900, was due to the trade at Chifu, where the other articles enumerated also showed advances for that quarter, but in the following quarter there was a general decrease. And the returns at Tientsin and Niuchwang for the quarter ending September 30, 1900, showed almost the annihilation of trade at those ports. For the last-named quarter the customs receipts at these three ports amounted to 238,506 haikwan taels, against 809,308 haikwan taels in the corresponding period of 1899; and the customs revenue for all China during the one quarter was 5,163,795 haikwan taels and during the other quarter 7,623,386 haikwan taels.

The total imports from the United States in 1900 were valued at 16,724,493 haikwan taels (\$12,053,342) and the total exports to the United States at 14,751,631 haikwan taels (\$10,631,500). These totals, however, on account of the method of recording used by the customs, which was pointed out in a foregoing paragraph, are far from showing the true value of American goods bought in China and *vice versa*. Careful estimates made by the United States consul-general at Shanghai led that official to believe the value of American imports in 1900 exceeded \$18,000,000, while the difference with regard to the exports was proportionally even greater. It may be fairly assumed, then, that "the United States buys more goods from China than does any other nation," and that the total American trade with China exceeds that of any other country except Great Britain. In the spring of 1900 the most rapidly growing trade in China was the American, but a year later German trade was proportionally increasing faster.

Railways and Telegraphs.—In China proper there are three lines of railway in operation: the Chinese Imperial Railway (built by British capital); the line from Peking to Pao-ting-fu (built by British capital, but since January, 1900, in the hands of a Belgian syndicate, which some suppose is acting for Russia); and the line from Shanghai to Wusung (British). The last named is only 12 miles long. The Chinese Imperial Railway extends from Peking to Tientsin (80 miles), thence to Tong-ku (27 miles), to Shan-hai-kwan, on the Manchurian border (147 miles)—total, 254 miles. The railway from Peking to Pao-ting-fu is 88 miles long and has a branch of 10 miles. From the foregoing it appears that the completed railways in China proper have a total length of 364 miles. Two railways are under construction: the so-called Peking-Hankow line and the Shantung line. The former line, which is being built by the same Belgian syndicate that controls the line from Peking to

Pao-ting-fu, will connect the latter town with Hankow. At the end of 1901 work on this line was progressing steadily; though much damage had been done by the floods of the preceding summer, rails had been laid in November a distance of 165 kilometres (103 miles) north from Hankow, and the work was advancing at the rate of about half a kilometre a day. The Shantung line is being constructed by the Germans inland from Kiao-Chau. In September, 1901, about 100 kilometres (62 miles) were completed, and it was expected that by May, 1902, the line would be in operation as far as Weihien, where the great land routes of the southern part of Shantung converge.

Among the more important lines projected in China proper, but not begun at the end of 1901, are: Hankow to Canton (projected by an American syndicate); Canton to Woohang (American and British); Shanghai to Nanking (British), 250 miles; Lao-kai to Yunnan-sen (French), 291 miles. See *INDO-CHINA, FRENCH*.

Outside China proper are the extension of the Chinese Imperial Railway and the Russian lines in Manchuria. The former runs from Shan-hai-kwan (193 miles) to Niuchwang, there connecting with the Chinese Eastern Railway (Russian); near Chen-chou, 113 miles from Shan-hai-kwan, there are two branches, 7 and 30 miles in length respectively. The Chinese Imperial Railway, with the 254 miles in Chili, has a total length of 484 miles. The section of the Russian Siberian line from Vladivostok across Manchuria was opened November 3, 1901 (see *RUSSIA*). Harbin, on the Manchurian railway, is to be connected with Port Arthur, 653 miles distant. In 1900, 318 miles of this line, running north from Port Arthur through Niuchwang to Telin, near Mukden, were completed.

All the principal cities of China are connected by telegraph, and Peking has overland connections with Europe. The telegraph lines have a length of about 14,000 miles, and new lines are being constructed.

HISTORY.

The Peace Protocol Negotiations.—In the last days of December, 1900, the joint note, embodying the terms upon which the peace protocol was to be negotiated, was signed by the representatives of the powers at Peking, and presented to the Chinese commissioners, Li Hung Chang and Prince Ching. The United States representative, Mr. Rockhill, suggested that the consideration of the indemnity and the question of commercial treaties be transferred to some other capital than Peking, preferably Tokio or Washington, but the proposition was not accepted by the other Powers, and on January 12, 1901, the Chinese commissioners signed the preliminary note submitted to them, and negotiations began. The imperial edict authorizing the commissioners to sign the note, expressed the hope that the sections prohibiting the importation of arms or military goods, the demolition of the Taku forts, the establishment of legation guards, and the section relating to the indemnity would be modified. Early in the negotiations a request was made by Prince Ching and Earl Li for the transfer of the Forbidden City to the Chinese in order that preparations might be made for the emperor's return. The request was denied by the ministers on the ground of a previous decision that no concessions whatever should be granted the Chinese until they had shown by their deeds a compliance with the terms laid down in the preliminary note. The first joint session of the foreign envoys and the Chinese commissioners, whose number had been increased to four by the addition of Sheng, mayor of Shanghai, and Chou-fu, former Chinese minister to Korea, as advisory members, took place on February 5.

The Discussion of Punishments.—The first section of the note, providing for expiatory missions to Japan and Germany, was accepted without debate, but the second, providing that the "most severe punishment befitting their crimes" should be inflicted by the Chinese on certain persons designated by the ministers as responsible for the outbreak and outrages of 1900, gave rise to prolonged discussion. At the first session the envoys submitted a list of twelve Chinese officials, guilty of crimes against international law, whose punishment was demanded. On February 6 the foreign ministers decided to demand the infliction of the death penalty on every man on the list presented, notwithstanding the fact that the wording of the preliminary note had been changed, at the instance of the United States, from "death penalty" to "most severe punishment." The Chinese commissioners were willing to give assurance of the execution of Prince Chuang, the commander-in-chief of the Boxers, and of Yu-Hsien, one of his chief lieutenants, but urged leniency for the others, particularly Prince Tuan, Duke Lan, and General Tung Fu-hsiang, the commander-in-chief of the Chinese army. After some discussion the envoys consented to a commutation of the death penalty in the cases of Tuan and Lan to perpetual exile, it being understood, however, that sentence of death should first be passed upon them. The final agreement, reached on February 20, was in the nature of a compromise. According to this arrangement the imperial court was to commute the sentences of Tuan, Lan, and Tung to life imprisonment, to allow Chuang to be strangled instead

of decapitated, and to allow the others to strangle themselves or be beheaded. A month later (March 18) an additional list of 96 minor officials, charged with complicity in the outrages, was presented by the envoys with recommendation that they be punished as the Chinese should see fit, both the United States and Japan recording themselves as opposed to any further "unnecessary bloodshed."

Indemnities.—By far the most puzzling question before the envoys was that of the amount of the indemnities to be paid, both to natives and to private individuals and societies or corporations. Discussion of the matter was taken up about the middle of March, 1901, and immediately the greatest diversity of opinion was exhibited, both as to the amount to be demanded and the provisions for securing its payment. The question of the private claims, however, not being covered by the protocol was only discussed in a general way. At the outset there was radical difference of opinion among the representatives of the powers as to the amount that China could and ought to pay. The United States urged that the total indemnity be not more than \$200,000,000, and in her stand for a low figure was supported by the Japanese and British ministers, whose minimum estimates, however, were somewhat larger than that of the United States. The demands of Russia, Germany, and France, however, were absurdly high. The United States, seconded by Great Britain, announced it as a part of her policy to favor a low indemnity, being willing even to reduce this amount in exchange for guarantees for the safety of foreigners and the extension of trade and commercial privileges. It was held by these nations that it would be for their own benefit as well as China's, not to demand an indemnity that would cripple China and leave her practically bankrupt, possibly rendering her even unable to complete the payment of the indemnity. Such a failure to pay would probably be followed by more international wrangling and even by seizure of territory in lieu of defaulted payment, an act which would open the way for a general partition of China among the Powers. Germany and France in particular were probably favorable to the plan for this very reason; but the position of Russia, which is not ready for a partition until her development of Siberia is more complete, was not so certain. The aggregate amount of the various claims, as originally submitted, amounted to between \$400,000,000 and \$500,000,000. The original plan for the payment of a separate sum to each country, according to its demands, gave way after discussion to the plan proposed by Mr. Rockhill, that payment be made in a lump sum, and the share of each nation be thereafter assigned by the ministers, an international commission, appointed for the purpose, or the Hague Tribunal.

A statement of the American policy, which was understood to be framed on practically the same principles as that of Great Britain and Japan, was officially presented to the other envoys. The statement favored the payment of a lump sum to be kept within the limit of \$200,000,000, if possible, and to be afterward divided proportionately among the claimant Powers by the Hague Tribunal. This statement of policy was submitted as a formal proposition and was finally rejected, except so much of it as provided for the payment in gross. On May 9 the envoys addressed the Chinese government in a collective note, informing it that the Powers would require for losses and expenditures until July 1, 1901, the sum of 450,000,000 taels (at the rate of exchange then existing equal to about \$337,000,000). An official admission of liability on China's part was requested. The Chinese reply was given on May 12. It accepted the obligation to pay adequate compensation contained in the preliminary note, but expressed amazement at the amount demanded and urged a considerable reduction. If the full amount were insisted upon, however, China would undertake, so the commissioners replied, to pay the 450,000,000 taels in 30 annual installments of 15,000,000 taels each, payment to be made by raising 10,000,000 taels from the salt tax, 3,000,000 from native customs, and 2,000,000 from inland transit duties. The Chinese commissioners further proposed an average increase of 15 per cent. in import duties, a proposition which the envoys would not entertain, although all were willing that there should be some increase in customs duties. On this proposal, Russia, France, Germany, and the other nations whose commerce with China is comparatively insignificant urged an immediate increase of 10 per cent., while Great Britain, Japan, and the United States favored an effective increase of 5 per cent., holding that an arrangement to pay the indemnity by a large increase of the customs on imports would really mean that the Powers which demanded the least indemnity would pay those which demanded the most. The reply of the commissioners accepting the envoy's indemnity proposals was followed by an imperial decree on May 27, declaring China's unconditional acceptance. That point being settled, the envoys set themselves to determining how China should be allowed to raise the indemnity, and by what methods its payment should be guaranteed. Among the Chinese themselves there appeared to be no clear agreement as to how the money should be raised, the imperial government favoring an increase in internal taxes and transit and salt charges—in other words, the provincial revenues; while the Yang-tse viceroys not unreasonably replied that they took no part in the Boxer uprising, and

that the chief pecuniary burden properly belonged to Peking and the province of Chili

When the question of the guarantee of the indemnity came before the envoys, France and Russia proposed a joint guarantee, which was vigorously opposed by Great Britain and the United States, who also joined in opposition to Russia's tariff proposal, with the result that late in June an agreement was reached to the effect that the Chinese method of payment should be by issue of her bonds, and that the security should consist of an increase of the tariff on imports to an effective 5 per cent. specific duty on all articles then nominally subject to that rate by treaty, or which should be added to it by an international commission, it being understood that cereals should be free. Native customs, the salt tax, and maritime charges were to constitute a further guarantee. On July 26, after fully four months of discussion, the final terms of the agreement relating to the indemnity were decided upon. The amount of 450,000,000 taels will bear interest at 4 per cent., payable semi-annually, payment of the principal to begin in 1903, and continue in increasing installments until 1940, at which time the indemnity obligation shall have been satisfied. The total payments of principal and interest will amount to almost \$700,000,000. Payments will be made to a mixed committee at Shanghai, to be known as the Committee of Encashment, and to be composed of representatives of foreign banks in that city.

The Protocol.—The final draft of the protocol was signed by the representatives of eleven Powers at Peking on September 7, 1901. The signatory Powers were Russia, Germany, France, Great Britain, the Netherlands, Belgium, Spain, the United States, Japan, Italy, and Austria-Hungary. The text of the protocol consisted of a recital of the compliance of China with the conditions laid down in the preliminary note. It may be summarized as follows, the articles corresponding with those bearing the same numbers in the preliminary note:

Article 1. (a) The agreement to atone for the assassination of Baron von Ketteler, the German ambassador. (Fulfilled by the mission of Prince Chun to Germany.) (b) Acquiescence in the demand that a memorial monument be erected to Baron von Ketteler in Peking.

Article 2. (a) Punishments inflicted in accordance with the demands of the Powers. (b) Suspension of official examinations for five years in all cities where foreigners were massacred.

Article 3. Atonement for the murder of Chancellor Sugiyama, of the Japanese legation, by an expiatory mission to Tokio.

Article 4. Agreement to erect expiatory monuments in desecrated foreign cemeteries.

Article 5. The importation of arms and war materials into China prohibited for two years

Article 6. Agreement for the payment of an indemnity of 450,000,000 taels, and provisions for its payment and guarantee, the value of the tael being fixed at 74.2 cents

Article 7. The fortification and garrisoning of the foreign legations provided for.

Article 8. Destruction of the Taku forts promised.

Article 9. Garrisons of foreign troops to be maintained on the road from Peking to Taku.

Article 10. Provision made for the publication throughout China of imperial edicts providing (a) prohibition of membership in anti-foreign societies; (b) for public announcements of the punishing of the Boxers; (c) for the suspension of examinations; (d) for placing responsibility for disturbances on provisional governors and local officials.

Article 11. Extension of treaties of trade and commerce.

Article 12. Reformation of the Tsung-li-Yamen and agreement as to the evacuation of Peking.

The Manchurian Question.—The attempt of Russia to establish a protectorate over Manchuria was, aside from the peace settlement itself, probably the most important and significant occurrence in the history of China in 1901. An agreement between the Chinese military officials and the Russians at Mukden, reported on the last day of 1900, provided for a resumption of Chinese civil government in Feng-Tien, the southern province of Manchuria, under what amounted to practically a Russian protectorate with full military occupation. Count Lamsdorff, the Russian minister for foreign affairs, however, replying on February 17 to an inquiry of Lord Lansdowne, the British minister for foreign affairs, as to the nature of the agreement, disavowed any intention on Russia's part to establish a protectorate, and declared that "nothing beyond the terms of a temporary *modus vivendi* during the occupation of the Russian troops was being negotiated." The Russian idea of a "temporary *modus vivendi*" was made known to the world on the publication of the text of the proposed "agreement" on February 27. The agreement provided for a

Chinese civil administration under the protection of the Russian army, that no army should be maintained there by China until after the completion of the Manchurian railway, and then only such an army as Russia might advise; that Chinese officials guilty of hostility to Russia should be degraded; that no foreigners (other than Russians should be employed in the military or naval service in the "northern provinces;" that without Russia's consent, no mining, railway, or other rights should be conceded in any Chinese territory bordering on the Russian possessions, nor should China itself build such railways, but should confirm the existing concessions for the Manchurian-Peking railway and other Russian projects. Such was the situation, when on March 23, 1901, China formally appealed to the various Powers to intercede for her against Russia's claims. Thereupon it was suggested by Germany that any Russo-Chinese agreement entered into during the pendency of the negotiations, before being ratified, should be laid before the ministers at Peking. To this proposal Russia, however, would not agree. This action of Germany, on the other hand, placing her in line with the policy already known to be that of Japan, Great Britain, and the United States, brought matters to a climax, and on April 5 it was announced by M. Paul Lessar, then Russian ambassador at London, that it was "the intention of the Russian government not to proceed with the Manchurian agreement, but to await the development of events, remaining faithful to the programme which they had followed from the beginning."

Toward the end of June, interest in the question was revived by the report that M. de Giers, then Russian minister at Peking, was pressing the Chinese government to reopen the question of an agreement as to Manchuria as soon as the protocol should be signed. No attempt to deny this report was made by M. de Giers. In explanation and defense of Russia's position he stated that the previous objection of the Powers, to which Russia had given way for the time being, was based by them on the contention that Russia ought not to carry on with China joint negotiations with the other Powers and at the same time separate negotiations on her own account. This objection, he declared, would cease with the signing of the final protocol. The necessity for some sort of an agreement to reestablish peace and order in Manchuria was acknowledged by the other Powers, and it was further agreed that Russia's railway and other interests in the region were so important as to give her certain special rights and privileges in any arrangement made. That her interests, however, gave her any right to establish a protectorate over the country, maintain an army there indefinitely, or demand a practical monopoly of trade and traffic rights, the Powers were almost unanimous in denying. In October, 1901, it was announced from Peking that M. Paul Lessar, who had succeeded M. de Giers as Russian minister to China, had completed negotiations with Li Hung Chang for a new convention in regard to Manchuria on the lines of the agreement abandoned in April. Although the text of the new treaty was not made public, it was generally understood that the terms were much more favorable to China than those of the previous treaty, and provided for the definite withdrawal of Russian troops from three of the provinces within a year and the restoration of the Shan-hai-kwan-Niuchwang railway to Chinese control. Enough of the objectionable features of the April agreement remained, however, to cause the other Powers interested to await, with considerable impatience, China's action upon the treaty; and, although it does not appear that any actual pressure was brought to bear to bring China to reject the Russian proposals, it is probable that she knew the Powers were as much opposed to the new arrangement as to the previous one, and would sustain her if it were rejected. Prince Ching was known to be opposed to the acceptance of the terms, and on the death of Li Hung Chang on November 7, it was officially announced that no agreement had then been arrived at, and that negotiations would be discontinued for the time being. In the latter part of November they were resumed, but no settlement had been reached by the end of 1901. Whether Russia will continue to insist on a virtual protectorate over Manchuria in the face of this opposition remains to be seen. The very fact that her interests in the region are so great make it appear unlikely that she will take any action that will disturb the existing peace. But Russia's ultimate possession of Manchuria, which forms the natural connection between Siberia and the open waters of the Pacific, seems a certainty; as an English writer, Mr. Archibald Colquhoun, puts it, "It is as impossible for Russia to abandon Manchuria as for England to abandon Egypt." Meanwhile, pending an agreement, the Russian army remains in the country and Russian officials administer the government.

Military.—The year 1901 opened with the armed forces of the allied Powers still in complete control of Peking, Tien-tsin, and the connecting road, and it was announced that no part of this force would be withdrawn until China had shown a compliance with the terms of the preliminary note. At the same time China was given to understand that the Powers were anxious to be relieved of the responsibility attached to the occupation, and that its continuance was simply an item of expense which China would be called upon to settle. The military operations of the allies

in the early months of the year, although frequent, cannot be considered as constituting a definite campaign. The expeditions generally accomplished the purpose for which they were sent out, namely, to quell Boxer uprisings in various districts. They also had the effect of impressing the imperial government and the Chinese people with the fact that the allied Powers still controlled the affairs of the nation. Unhappily the action of some of the expeditionary forces created another impression, and one that could scarcely be said to produce on the Chinese mind a favorable idea of western civilization. This was the impression created by the excesses and outrages committed in particular by the French and German troops. The forces of the United States, Great Britain, and Japan, from all reports, appear to have been practically above criticism in this respect. On February 18, 1901, Field-Marshal von Waldersee, the commander-in-chief of the allied armies, notified the generals in command of the various forces to prepare for an eighty-day campaign in the interior. It was understood that the expedition was to be in the direction of Si-gnan-fu, the temporary capital, for the purpose of forcing the court, if possible, to hasten negotiations. General Chaffee, the American commander, following the lines of the policy announced at Washington, refused Count von Waldersee's invitation, stating that the United States disapproved of further military operations, save such as were actually necessary to protect the lives and property of foreign residents, and notifying him at the same time that all the American troops, except a legion guard, would be withdrawn at an early day. Russia, too, forbade her troops to take part in the proposed campaign, and the reply of the British commander was non-committal. A week later it was announced that the expedition had been postponed, but its mere proposal seems to have had the desired effect of hastening the negotiations. During the month of March, however, both German and French troops engaged in "punitive expeditions," some of them of considerable magnitude, and complaints of outrages committed by the troops continued.

On March 15, 1901, friction was reported between the Russian and British troops at Tien-tsin. The dispute arose over the claim of Russia to a considerable area on the left bank of the Pei-ho, the occupation of which by Russian troops had been ratified by China. The land, however, comprised a large tract belonging to the North China railway, a British company. The presence of British workmen under protection of British troops was resented by the Russians as a trespass, and for a few days the outlook was serious. The governments of both nations, however, showed a conciliatory spirit, and on March 21 the proposal of Count Lamsdorff, the Russian minister for foreign affairs, that all questions of title and proprietary right be reserved for later examination by the two governments, and that meanwhile the troops of both nations be withdrawn, was readily accepted by Lord Lansdowne, and further trouble was averted.

Late in April a combined French and German expedition was organized to operate against the Chinese general, Liu, in the province of Shan-si. At the last moment the French contingent was withdrawn and the German force proceeded alone, inflicting several severe defeats upon the Chinese. The expedition was criticised as entirely uncalled for, and it was declared by the English press that the policy of Von Waldersee was more likely to prevent than to hasten the restoration of order.

General Chaffee and the American troops, with the exception of Company B, Ninth Infantry, which was retained as a legion guard, left Peking on May 5, 1901, and sailed for Manila on May 22. The Russian and Japanese troops were withdrawn gradually during the month of May, and by the middle of June a considerable portion of the French and German armies had been withdrawn. Count von Waldersee left Peking on June 3. On September 17 the control of the city of Peking was formally transferred to China, all the troops except the legion forces being withdrawn by that date. Of the remaining foreign troops in China a part, according to the terms of the protocol, are to occupy stations on the road from Peking to Taku, to provide, it is said, for the escape of the legations in case of a revival of the conditions of the summer of 1900, and somewhat larger forces are to be maintained in the foreign sections of Tien-tsin. During the summer the British, French, German, and Italian legations in Peking were rebuilt into actual fortresses and machine guns mounted within them. It was announced that the British troops in China would consist of 1,800 men at Peking and 3,000 more scattered from Peking to Taku. The German army of occupation was announced to consist of 4,000.

American Policy in China.—The diplomacy of the United States in regard to China has been noteworthy, not only because of its clearness and entire lack of arrogance or disposition to "grab," but because of the really important part it played in shaping the policy adopted by the allies. While this has undoubtedly been much exaggerated by the American press, it is nevertheless true that many of the most important points in the policy of the allies during the negotiations were "made in America." These were largely in the line of compromises or of greater leniency toward the Chinese, suggestions which the other Powers were more ready to adopt

because of the evidently sincere official denial of the United States of any desire for territorial acquisitions within the borders of the Chinese empire. From the very first the United States stood out strongly against any policy that tended toward a partition of the empire, or an abandonment of the "open door" policy as to foreign trade. Again, American diplomacy insisted on the importance of helping China in every possible way to maintain her place as an independent nation. For this reason the influence of the United States was exerted in behalf of allowing China herself to punish those connected with the Boxer uprising, holding that it would be a disregard of her independence to take the punishment out of her hands. When this policy had been adopted, and the negotiations further complicated by the fact that China objected to the insistence of the Powers on the death penalty for the offenders, the United States secured, as a concession, the privilege of allowing China to impose as well as inflict the penalties herself. When the question of the indemnity arose, the United States suggested the payment in gross, and, together with Great Britain and Japan, held that it would be bad policy to cripple China by the imposition of an indemnity which she would be unable to pay, but that it was to the interest of all concerned to insure rather than undermine her financial stability. On almost every point under discussion American policy was of the most conservative sort, and the good faith and sincerity of the United States was nowhere more clearly shown than in its stand in regard to punitive expeditions and the question of the military occupation. At the close of 1901 negotiations were in progress looking toward the securing of a concession at Tien-tsin for an "American quarter." On December 27, at a cabinet meeting, the International Banking Company, a Connecticut corporation, organized to establish banks in foreign countries, was designated as the fiscal agent of the United States in China, and its branch at Shanghai was authorized to collect the payments due on the indemnity. A St. Petersburg dispatch stated unofficially on December 31 that Sir Robert Hart, the Anglo-Chinese financier, and two Americans, Mr. W. W. Rockhill and former Secretary of State John W. Foster, had been appointed official advisers to China in foreign affairs.

The Situation at the Close of 1901.—In spite of many defects in the protocol, and the likelihood that many of the reforms promised would not be effective, the situation in China at the close of the year was encouraging. Practically all the terms imposed by the Powers had been complied with. The murder in June, 1900, of Baron von Ketteler, the German ambassador, had been atoned for by the mission to Germany of Prince Chun, the emperor's brother, who apologized to the kaiser personally at Potsdam. The killing, also in June, 1900, of Chancellor Sugiyama, of the Japanese legation, was expiated by a similar mission to Tokio. On July 24, 1901, an imperial decree, as provided for in the preliminary note, abolished the Tsung-li-Yamen, the old council on foreign affairs, and established a single-headed ministry of foreign affairs, the Wai-wu-pu, in its stead. The position of the empress-dowager, while much more favorable to reform than ever before, was still considered something of a menace to continued peace. The article in the protocol providing for the publication of imperial decrees throughout the empire and the edict against membership in anti-foreign societies, were looked upon as matters of considerable importance if such edicts could be properly enforced.

As to the position of the nations in China at the close of the year it may be said that on the whole, Russia, France, and Germany, whose demands on China were most exacting, have been distinctly gainers as a result of the negotiations, while the interests of Great Britain, Japan, and the United States, who stood together for a moderate treatment of the Chinese, have suffered. Russia's gain lies chiefly in the strengthening of her hold in Manchuria although the final disposition of that question was not reached, and in an increase of power as an arbiter of affairs in North China generally. The gain of France and Germany is rather to be reckoned as one of prestige, consisting largely in a recognition of their claims to spheres of influence in the Yang-tse valley as being on a par with that of Great Britain. As a consequence, Great Britain's allowance of their claims amounts to a dropping of her assertion of paramountcy in the region. The loss to Japan is principally an undetermining of its influence in North China, Manchuria, and Corea in favor of Russia, rendering it less probable that Corea will ever be under Japanese control. The loss to the United States, which is rather conditional than actual, consists in the menace to the open door contained in Russia's position in the north. As to how far China is sincere in its promises of reform it is too early to say. As to how far the imperial government can enforce the reform edicts if it tries seems to be a matter of great difference of opinion. Some observers profess to view the situation with complacency and express in the most optimistic terms their belief that there will never be a recurrence of the evil days of 1900. Others go just as far in the opposite direction and prophesy a widespread international war and the total dismemberment of the empire within five years. An American writer in the *Forum*, Mr. Mark H. Dunnell, formerly deputy United States consul-general at Shanghai, well summarizes the situation after the settlement as follows:

"The root of the difficulty in our relations with China lies in the fact that we impose upon her by force the obligations of a sovereign state in the family of nations, and at the same time withhold from her the rights of such a state. The western Powers say to China: You must allow our people to live among you; you must allow our merchants to trade and our missionaries to proselytize; you must allow us to navigate your inland waters and participate in your coasting trade, although we ourselves do not accord such privileges to the foreigner; you must allow us to send you opium, although you declare that it is injurious to the health and morals of your people, and that you could stamp out domestic production if importation were stopped; you must allow us to fix the amount of customs tariff we shall pay on your imports from us, although we ourselves regard the right of taxation as the most sacred of sovereign rights; you must allow our missionaries to reside in the interior of your country, but you must not exercise any authority over them, although their residence is so remote that our own officials cannot control them; you shall not enjoy the full reciprocity which obtains between Christian states in the exercise of jurisdiction over the subjects or citizens of each other in their respective territories, for your laws are barbarous, your judges ignorant and corrupt, and your prisons loathsome; we will not admit you into the family of nations on terms of equality, but we will, nevertheless, compel you to act as if you were so admitted; you must discharge the obligations of civilized intercourse, however ignorant you may be of them; in short, you shall bear the burdens of civilization, but you shall not enjoy its privileges."

CHOLERA. See VITAL STATISTICS.

CHRISTIAN AND MISSIONARY ALLIANCE. The report of the society for 1900-01 indicates notable financial prosperity, the receipts for the year, including amounts handled both by the treasurer and through special departments, aggregating \$265,000, an increase of 70 per cent. over the preceding year. Of this sum \$100,000 was devoted to the relief of famine sufferers in India. The alliance carries on an active home missionary work, the United States being organized into districts, and maintains foreign stations in India, China, Japan, the Philippine Islands, Africa, Palestine and Arabia, the West Indies, and in several South American states. During the year 1901 meetings were held in various places, the annual convention at the Gospel Tabernacle, New York, October 4-14, being marked by an enthusiastic attendance of workers from many parts of the world. President, Rev. A. B. Simpson; secretary, Rev. A. E. Funk; headquarters, 690 Eighth Avenue, New York City.

CHRISTIAN CATHOLICS (DOWIE). The adherents of John Alexander Dowie, the apostle of "divine healing," constitute a comparatively recent sect which makes its headquarters in Chicago, where there are now 10 "tabernacles of Zion." The Christian Catholics observe strictly the dictates of religion and morality, and are advocates of divine healing through the efficacy of prayer, a tenet which distinguishes them from the followers of Christian Science, though both sects dispense with medical aid. The most notable event of 1901 occurred on June 2, when, before a great assembly in the Chicago Auditorium, the apostle announced himself as Elijah returned to the earth, this being the third appearance of the prophet, who has come as Elijah, as John the Baptist, and as John Alexander Dowie—a claim which subsequently was accepted by a large gathering of the priesthood of the church. The death in Chicago of a woman under treatment by "divine healing" evoked widespread protest against the sect; early in July some twenty disciples of Dowie were roughly handled at Evanston, Ill., where they were attempting to hold a meeting; and toward the close of the year "Dr." Dowie became the defendant in a suit arising from an alleged repudiation of a business promise in connection with the "Zion" lace industry. The sect declines to issue statistics as to its numbers, but it is believed that there was during 1901 a substantial increase over the estimated 40,000 of 1900.

CHRISTIAN ENDEAVOR, UNITED SOCIETY OF, an interdenominational and international order, founded in 1881, at Portland, Me., to serve as a training school for the duties of church membership. The society now has 61,427 societies and adherents approximating 4,000,000; there are over 16,000 Junior societies, with 483,000 members, and 1,285 Intermediate societies, with 38,500 members—statistics which indicate an addition of some 2,000 new societies and 100,000 members during 1901. In the United States there are 43,272 societies, including 1,000,000 members. Christian Endeavor constitutions are now issued in 30 different languages. An international convention, held July 6-10, in Cincinnati, was characterized by a notably large attendance, with delegates present from Japan, China, India, and Australia. A memorial letter to Rev. Francis E. Clark, D.D., the president and founder of the society, signed by eminent persons in various vocations, was a feature of the meeting. The next assembly convenes in 1903. President Rev. Francis E. Clark, D.D.;

treasurer, William Shaw; general secretary, John Willis Baer; headquarters, Tremont Temple, Boston.

CHRISTIANS, a sect of the United States which originated during the early part of the nineteenth century, in a membership derived from several other existing bodies. The two branches, Christian Connection and Christian Church (South), which withdrew at the time of the slavery agitation, but are now in close relation, have 109,278 members, 1,517 churches, and 1,151 ministers. There are over 60 conferences, those of the South being organized of both white and colored members. General meetings of Christians of a representative character have been held at periods of one, three, or four years since 1819, and since 1834 have been of a more thorough organization; the American Christian Convention, in its present form, was established in 1866. The Christians have several educational institutions, including a theological seminary, known as the Christian Biblical Institute (founded in 1868), located at Stamfordville, N. Y., and maintain a publishing house in Dayton, O. *The Herald of Gospel Liberty* and the *Christian Missionary* are representative publications. The denomination pursues organized lines of missionary work—the success of its domestic missions being evidenced in the establishment during 1901 of 6 new churches and 7 Sunday schools, while in the foreign department, which already included Japan, work has been extended to Porto Rico. There are now in these fields 22 workers (9 missionaries), 7 churches, with 348 members, and 16 Sunday schools, with 725 scholars.

CHRISTIAN SCIENTISTS, the followers of Mrs. Mary Baker G. Eddy, who, in 1866, founded the sect which has since attained to an approximate membership of 100,000, though the avowed adherents of the Church of Christ, Scientist, are estimated at several times that number. There were in 1901, 497 churches, 377 of which were in the United States and the remaining 120 in England, Scotland, Canada, France, and Germany; in each church two "readers" conduct the services, a total of 994 throughout the body. The membership of the First Church of Christ, Scientist, in Boston, the "Mother Church," is 22,114, an increase of 3,029 in the past year. Besides the regular branch churches, 53 of which were established during 1901, there are 167 places (158 in this country) where services are held. Twenty-eight of these societies were established in 1901. *The Christian Science Journal* (monthly) and *The Christian Science Sentinel* (weekly) are published under the auspices of the church. The annual letter of Mrs. Eddy, read June 23, 1901, in the Christian Science Temple, Boston, is devoted to the exposition of the tenets of Christian Science concerning God and evil, and to a specific defense against critics. During the year there were controversies, such as have been frequent in the past, over the refusal of Christian Science adherents to receive medical aid in cases of illness which have terminated fatally, the arguments of both opponents and adherents of the doctrines of Christian Science being vigorously presented. In some instances in New York City, neglect of probably curative measures was charged at inquests held by coroners upon people who had died without medical attendance. Similar cases met with similar condemnation at the hands of coroners' juries in Ontario and British Columbia in February, 1901. In Georgia the Superior Court denied the application for a charter by an institute of Christian Science, and rendered a decision that the Scientists cannot practice treatment of diseases without having regularly graduated in medicine and been licensed by the examining board of the State. In New York State a bill was introduced in the Assembly in January, 1901, designed to prevent the treatment of disease by Christian Scientists, but was so drawn as to allow loopholes of escape, in its definition of the practice of medicine, for illegal practitioners of the profession. This bill was known as the Bell bill, or No. 167, and aimed to amend section 151 of chapter 661 of the laws of 1893. After amendment the bill finally died in committee. A substitute bill, No. 1779, failed to meet the wishes of representatives of the medical associations and the opticians, and suffered a similar fate.

CHRISTIAN SCIENTISTS (REFORMED). See REFORM CHRISTIAN SCIENCE CHURCH ASSOCIATION.

CHRISTMAS ISLAND, situated in the Indian Ocean, 220 miles south of the western end of Java, is a British possession, having been placed under the government of the Straits Settlements in January, 1889. In the spring of 1901, Sir John Murray, the eminent British geographer and scientist, returned from a six months' expedition to the island, which he was the first to cross from end to end. The island is about 12 miles long and 7 broad, and contains about 50 square miles of dense forest. Murray found there 13 whites, "including a doctor, chemist, and engineer," and 720 coolies, who were engaged in working the phosphate deposits. It is believed that before the British annexation no human being lived on the island. The fauna of the island is of great interest. There are large numbers of red crabs, as much as 18 inches in diameter, toothless snakes and blind snakes, and two species of rats not known elsewhere. Besides the rats there are only three species of mam-

mal. The island has a central plateau, 1,000 feet in height. The sea depth off shore is three to four miles. In the spring of 1901 the government at Singapore dispatched to Christmas Island a resident magistrate, an official of the department of public works, a scientific commission, and a force of police—35 in all. Administration buildings will be erected. The phosphate beds are of considerable importance; "pits have been dug through the phosphate deposits to a depth of 40 feet, and yet the bottom has not been reached, so that the quantity is enormous, and on one hill alone is placed 12,000,000 tons." The estimated output in 1900 was 37,000 tons, and it was thought that the quantity shipped in 1901 would amount to 175,000 tons.

CHROMIC IRON ORE. Practically no chromic iron ore was produced in the United States in 1900, for under present conditions it is not possible to mine the domestic ores at a profit; in fact, the production in this country virtually ceased in 1896. Turkey still remains the chief foreign source of chrome, though the chrome ore from Newfoundland is beginning to gain a foothold in the United States. The imports to the United States in 1900 were:

Chromate and bichromate of potash, 111,761 pounds.....	\$7,758
Chromic acid, 35,452 pounds.....	7,232
Chrome ore, 17,542 long tons.....	305,001
	<hr/> \$319,991

CHURCH OF CHRIST, SCIENTIST. See **CHRISTIAN SCIENTISTS.**

CHURCHILL, WINSTON, American historical novelist, produced his greatest success, *The Crisis*, in 1901. He was born in St. Louis, November 10, 1871, and was educated at the United States Naval Academy, where he graduated in 1894. He engaged at once in literary work and published his first novel, *The Celebrity*, in 1898, which was followed in 1899, by *Richard Carvel*, a novel of Revolutionary times, that had a large sale. *The Crisis*, which is a study of the American Civil War, in particular, as it affected the country about St. Louis, like *Richard Carvel*, sprang at once into great popularity; it was generally regarded as a careful, unprejudiced story of the conflict over the slavery question.

CINCINNATI, SOCIETY OF THE, founded 1783 by the American and French officers at the cantonments of the Continental Army on the Hudson at the close of the Revolutionary War, with the object of perpetuating the remembrance of the struggle and the mutual friendship formed during its continuance. Thirteen State societies were formed, and one in France; membership in the society descends to the eldest lineal male descendant, and under proper restrictions, to the descendants of female relations of members. By the death of the president-general, Hon. William Wayne, of Pennsylvania, in November, 1901, the presidency is vacant; secretary-general, Hon. Asa Bird Gardiner, of the Rhode Island Society. The office of the secretary-general is at Garden City, N. Y.

CIRRHOISIS. See **LIVER.**

CIVIL FEDERATION, NATIONAL. See **ARBITRATION, LABOR.**

CIVIL SERVICE REFORM. The annual report of the Civil Service Commission presents evidence to show the considerable progress of the merit system in the public service. The total salaries of positions in the classified service, appointment to which is made as the result of competition, amounts to \$75,000,000 per annum, while salaries of all unclassified positions in the executive branch of the public service slightly exceeding 100,000 in number, do not exceed \$30,000,000; 60 per cent. of this amount is for the compensation of 4,429 presidential postmasters and 72,165 postmasters of fourth class post offices. During 1901, 46,763 persons were examined, of whom 35,000 passed. Of the number who passed, 34,473 were for original appointments to the service, and of these 9,889 were appointed, the largest number ever appointed to the classified service. A constantly increasing number of persons are being appointed to the government service as a result of competitive examinations and a very small number of those appointed have been removed. Over 98 per cent. of the appointees after competitive examination have received absolute appointments at the end of their probationary term of service.

President Roosevelt's first message contained the following passage relating to the extension of the merit system to our island dependencies: "It is important to have this system obtain at home, but it is even more important to have it applied rigidly in our insular possessions. Not an office should be filled in the Philippines or Porto Rico, with any regard to the man's partisan affiliations or services, with any regard to the political, social, or personal influence which he may have at his command; in short, heed should be paid to absolutely nothing save the man's own character and the needs of the service." The administration of the civil service in

the Philippines, according to a recent report made to the National Civil Service Reform League, has been in full accord with the spirit of this declaration. In September, 1900, the Philippine Commission passed "An act for the establishment and maintenance of an efficient and honest civil service in the Philippine Islands." The purpose of this act was to establish a system of appointments through competitive examination. A set of civil-service rules was adopted in November, 1900, which gave to the Civil Service Board unusually large powers. The system is under the direction of the United States Civil Service Commission. Competitive examinations have been held in the United States for the following Philippine positions: Stenographers, typewriters, translators of Spanish, inspectors of boilers, and department assistants. Out of a total number of competitors of 436, 166 passed, of whom 127 became eligible for department assistants. Of the eligibles obtained, 29 had been offered positions up to December 12, 1901, and 22 had accepted. It was stated that a large number of additional appointments would be made as soon as the eligible list reached the islands. Prior to the establishment of separate registers for the Philippine service, 21 appointments were made from the eligible lists of the United States Commission, and 23 persons were transferred to the classified service.

The Civil Service Commission remarks of the Philippine Civil Service Act as follows: "The two features of the Philippine Civil Service Act, which distinguished it most conspicuously from the federal law are (1) its broad scope, embracing not only the offices of the general or central government, but also those in the executive branch of the provincial and municipal governments, and ultimately including every officer and employee from the heads of departments down to the unskilled laborers; and (2) its provisions requiring promotions to be made upon competitive examinations from the lower to the higher ranks, including all positions except the heads of departments and private secretaries of members of the Philippine Commission, and in the case of heads of departments providing that they shall be selected by promotion from a class to be composed of the first, second, and third assistants to the heads of departments."

The National Civil Service Reform League held its twenty-first annual meeting at Boston, December 12 and 13, 1901. The secretary for the committee on legislation stated that several bills relating to the organization of the civil service were before Congress, and that action on some of these might in future be recommended. Among these were: (1) A bill extending the preference in competitive appointments to disabled veterans over civilians, and to all veterans of the Civil War without reference to personal necessities resulting from disability; (2) the bills to reorganize the consular service, introduced at the last session by Senator Lodge and Representative Adams; (3) the various bills providing for the retirement of superannuated employees. The resolutions adopted by the League congratulated the country on the restoration to the classified service of 1,600 positions in the War Department, on the amendments to the Civil Service rules, improving the character of the Indian service, placing rural delivery post-offices in the classified list, and requiring officers of the government to attend and give testimony upon investigations held by the Civil Service Commission, preventing the abuse of collusive transfers, and prohibiting the payment of salaries to persons illegally appointed; on the removal or refusal to appoint officials who have violated the civil service law; on the excellent character of the President's first appointment to the Civil Service Commission; and on the result of the election in New York City. The recommendations of the League are as follows:

"That the appointments to the entire labor service of the United States be regulated by rules as to registration similar to those which have been found so successful in the War and Navy departments; to the extension of the competitive system to appointments in the municipal service of the District of Columbia; the application to the Consular Service of competitive methods for the ascertaining of the fitness of candidates for appointment, similar to those now prevailing under the Civil Service Commission; the continued enforcement and development of the admirable Civil Service principles which have been laid down for the organization of the public service in our insular possessions. It urges the opposition of the plan to include the temporary appointees of the Census Office in the classified service and the enactment of any legislation similar to the Veterans' Preference Bill, defeated at the last session of Congress. The Investigating Committee of the league reported the following violations of the Civil Service Law to the President within the past year: (1) On the abuses in the Indian service—no actions as yet taken; (2) on the violations of the law by Postmaster Hicks, of Philadelphia—the offender was not reappointed; (3) on the assignment of government laborers to clerical duties—abuse remedied in the War Department; (4) on alleged violations of the civil service law by the collector of internal revenue at Louisville, Ky., by the collector of customs at El Paso, Tex., and by the postmaster at Jersey City, the first two officials being removed and the third having voluntarily resigned; (5) on the census frauds in the southern counties of Maryland—J. H. Cling being subsequently sentenced to two

years' imprisonment for instigating them; (6) on abuses in the selection of subordinates of the House of Representatives—no action; (7) on constructive exemptions of federal officers from classification—action taken in the matter of rural free delivery, and President's message recommends the selection of special or temporary appointees from the classified list. The report of the committee on civil service in dependencies has already been mentioned. The committee on superannuation in the civil service recommended that those hereafter appointed to positions in the civil service be required 'to file with the government a deferred annuity policy, issued by reputable insurance companies and guaranteeing to the policy-holder, at a suitable age, the payment of a stipulated annual sum during the remainder of his life.' Of the State associations, Mr. R. Francis Wood, of Pennsylvania, reported that the civil service law in Philadelphia was defective in not providing proper machinery for carrying out its provisions, and that the whole system as carried out was 'nearly valueless'; Mr. George McAneny, for the New York Association, reported wholesale and widespread violations of the civil service law by the Tammany officials, extending over a period of 15 months prior to the fall election of 1901; and Colonel John W. Ela for the Chicago Association, reported that the successful battle for the enforcement of the civil service law passed in 1895, which at one time seemed well-nigh hopeless was 'the result of a quick, sharp campaign by the citizens' association; and now the County Civil Service Commission is composed of men of character and intelligence, who are actually holding *bona fide* examinations, intended to disclose the merit of the applicants, rather than the cunning of the examiners, and are otherwise giving promise of the future enforcement of the County Act."

CLARKE, THOMAS CURTIS, American engineer and bridge builder, died in New York City, June 15, 1901. He was born at Newton, Mass., September 16, 1827, and was educated in Boston schools and at Harvard University, from which he graduated in 1848. As a member of the Union Bridge Company of New York City, Mr. Clarke built a number of bridges in different parts of the world, including the Hawkesbury bridge in New South Wales, with foundations extending 185 feet below high water, and the Poughkeepsie bridge across the Hudson, with foundations 135 feet deep. He was one of the first to use concrete in large masses in the foundations and piers of bridges. He was president of the American Society of Civil Engineers in 1896, and was made member of the Institute of Civil Engineers of London in 1874.

CLARK UNIVERSITY, Worcester, Mass., opened in 1889. President, G. Stanley Hall, Ph.D. The institution in 1901 was open to graduates of other colleges only; it has aimed to supplement the work of other institutions by giving graduate work of an advanced and highly specialized nature along the lines of mathematics, physics, biology, psychology, and education. Beginning with the academic year 1902-03 the university will have a collegiate department. This has been organized to comply with the terms of the will of the late Jonas Clark, who gave \$2,500,000 to the university on the condition that a collegiate department be organized. As announced, this new school is to be a rather radical departure from any existing college, in that there are to be no entrance requirements and no specified course of study. The library contains about 20,000 bound volumes and 1,500 pamphlets. Of the bound volumes, about 3,500 are Congressional publications. The contents of the library refer chiefly to the five organized departments. The American Antiquarian Society Library and the Worcester Public Library, 100,000 volumes each, are freely accessible to students, and the facilities of the latter institution for borrowing from distant libraries are also available. There is, in addition, a system of exchange between Clark University and Harvard University. A summer school of two weeks was held in 1901, and a special Saturday class was provided for teachers. The publications connected with the university are *The American Journal of Psychology*, *The Pedagogical Seminary*, and *The Mathematical Review*. In 1900-01 the instructing and student body of the institution consisted of the president, 3 professors, 4 assistant professors, 3 docents, 24 fellows and assistants, 8 scholars, and 15 students in the Saturday class. See **PSYCHOLOGY, EXPERIMENTAL**.

CLAY. The output of clay products in the United States in 1900 was very large, but as far as brick and tile were concerned, it was somewhat lower than in 1899. Pottery, on the other hand, showed a substantial increase. The output of clay products for the two years was as follows:

Materials.	1899.	1900.
Common brick	\$39,887,522	\$38,621,514
Front brick	4,767,343	3,864,670
Paving brick	4,750,424	4,764,124
Fancy brick	476,191	289,698
Enameled brick	329,969	323,630
	\$50,211,449	\$47,863,636

The production of raw clay mined in 1900 amounted to 1,221,660 short tons, valued at \$221,507. The imports of raw clay in 1900 amounted to 144,107 long tons, valued at \$62,367, while the value of the imported earthenware, chimney brick, and tile was \$8,912,046. The value of the exported wares was \$1,281,831. The following reports were issued during 1901: *The Clays and Clay Industries of Wisconsin*, by E. R. Buckley (Wisconsin Geological and Natural History Survey, Bulletin No. 7, part 1); *The Clays of New York*, by H. Ries, Bulletin New York State Museum, Vol. 7, No. 35.

COAL. The United States now ranks easily first among the coal-producing nations, as its output which, for the first time in 1899, exceeded that of Great Britain, was even greater in 1900. The production of coal in the United States in that year was 269,444,859 short tons, valued at \$306,891,364, as against 253,739,992 short tons valued at \$256,077,434 in 1899. This is an increase of 6 per cent. in tonnage and of 16 per cent. in value. There was also an increase in the exports, but these amounted to but 4 per cent. of the total. The production of the different coal fields in the various States in 1900 was as follows:

Bituminous (including lignite, bituminous coal, and scattering lots of anthracite):

Virginia		Kansas	4,467,870
North Carolina..}	57,912	Arkansas	1,447,945
<i>Appalachian Field.</i>		Indian Territory.	1,922,298
Pennsylvania ...	79,842,326	Texas	968,373— 17,549,528
Ohio	18,988,150	<i>Rocky Mountain Field.</i>	
Maryland	4,024,688	North Dakota ..	129,883
Virginia	2,353,576	Montana	1,661,775
West Virginia...	22,647,207	Wyoming	4,614,602
East. Kentucky..	2,222,867	Utah	1,147,027
Tennessee	3,708,562	Colorado	5,182,176
Georgia	315,557	New Mexico.....	1,263,083
Alabama	8,394,275—142,497,208	Idaho	10
<i>Northern Field.</i>		Nevada	0— 13,398,556
Michigan	894,475	<i>Pacific Field.</i>	
<i>Central Field.</i>		Washington	2,474,093
Indiana	6,484,086	Oregon	58,864
West. Kentucky..	3,106,097	California	171,708— 2,704,665
Illinois	25,767,981— 35,358,164		
<i>Western Field.</i>			
Iowa	5,202,939		
Missouri	3,540,103		
			269,881,827

Of all the States, Arkansas showed the greatest percentage of increase, namely, 75 per cent., while in West Virginia there was an increase in value of 52.8 per cent., and in tonnage of 17.6 per cent. According to the *Engineering and Mining Journal*, the production of 1901 will probably exceed that of 1900 by 30 million tons, and it would no doubt have been still greater had there not been a great scarcity of cars for carrying the coal from the mines to the market. The production of anthracite in 1901 will probably exceed that of 1900 by eight million tons, although anthracite is now almost entirely a domestic fuel. This great increase in the production of coal in 1901 is largely due to exceptional prosperity and the absence of labor troubles. The value of the imports in 1900 amounted to \$1,113 for anthracite and \$5,006,881 for bituminous coal. The value of the exports was \$7,107,412 for anthracite and \$14,416,667 for bituminous coal. Up to December 31, 1901, the imports of bituminous coal amounted to 1,919,962 long tons, valued at \$5,291,429, while the exports for the same period were 5,390,086 tons of bituminous and 1,993,307 tons of anthracite.

There was considerable increase in the coal production of Alabama in 1901, due to the opening up of new mines, and among the western coals the Arkansas bituminous coal has attracted much attention on account of its smokeless character. Considerable quantities of it are shipped to the St. Louis market. There has also been great activity in the coal fields of Indian Territory, although the production of oil at Beaumont, Texas, has threatened to interfere somewhat with the coal from this region. Mention should be made of the recent development of the extensive beds of coking coal found at Baroteran in Northern Mexico, which an American company has developed, and their product will no doubt seriously interfere with the exportation of coal and coke from the United States and New Mexico. Lignite is said to exist in the Philippines, in Luzon, Botan, Mindoro, Masbata, Negros, Cebu, Mindanao, and other islands. Large fields are said to occur near Bulacacao. Among the recent publications dealing with coal may be mentioned the following: T. W. Vaughan, *Reconnaissance in the Rio Grande Coal Fields of Texas* (Bulletin 164, U. S. Geol. Survey); E. Ludlow, *The Coal-Fields of Las Esperanzas, Coahuila, Mexico*; N. R. Drake, *The Coal of Northeastern China* (Trans. Amer. Inst. Min. Eng., February meeting, 1901); *Notes on Scotch Coal-Fields* (Iron and Coal Trades Review, October 4, 1901); F. E. Saward, *The Growth of American Coal Exports* (Engineering Magazine, xxii, p. 321, 1901).

Rank of coal-producing States in 1900, with amount and value of product and percentage of each:

	Short Tons.	P.C.			P.C.
1 Pennsylvania:			1 Pennsylvania:		
Anthracite . . .	57,367,915	21.3	Anthracite ..	\$85,757,851	27.9
Bituminous. . .	79,842,326	29.6	Bituminous ..	77,438,545	25.2
2 Illinois	25,767,981	9.5	2 Illinois	26,927,185	8.8
3 West Virginia. . .	22,647,207	8.4	3 Ohio	19,292,246	6.3
4 Ohio	18,988,150	7.0	4 West Virginia ..	18,416,871	6.0
5 Alabama	8,394,275	3.1	5 Alabama	9,793,785	3.2
6 Indiana	6,484,086	2.4	6 Iowa	7,155,341	2.3
7 Kentucky	5,328,964	2.0	7 Indiana	6,687,137	2.2
8 Colorado	5,244,364	1.9	8 Colorado	5,858,036	1.9
9 Iowa	5,202,939	1.9	9 Wyoming	5,457,953	1.8
10 Kansas	4,467,870	1.7	10 Kansas	5,454,691	1.8
11 Maryland	4,024,688	1.5	11 Kentucky	4,881,577	1.6
12 Wyoming	4,014,602	1.5	12 Washington	4,700,068	1.5
13 Tennessee	3,708,562	1.4	13 Missouri	4,280,328	1.4
14 Missouri	3,540,103	1.3	14 Tennessee	4,223,082	1.4
15 Washington	2,474,093	0.9	15 Maryland	3,937,381	1.3
16 Virginia	2,393,754	0.9	16 Indian Territory..	2,788,124	0.9
17 Indian Territory. .	1,922,298	0.7	17 Montana	2,713,707	0.9
18 Montana	1,661,775	3.0	18 Virginia	2,123,222	3.6
19 Arkansas	1,447,945	3.0	19 New Mexico. . . .	1,776,170	3.6
20 New Mexico.	1,299,209	3.0	20 Arkansas	1,653,618	3.6
21 Utah	1,147,027	3.0	21 Texas	1,581,914	3.6
22 Texas	968,373	3.0	22 Utah	1,447,750	3.6
23 Michigan	849,475	3.0	23 Michigan	1,259,683	3.6
24 Georgia (a).	333,291	3.0	24 California	523,231	3.6
25 California	171,708	3.0	25 Georgia	393,469	3.6
26 North Dakota . . .	129,883	3.0	26 Oregon	220,001	3.6
27 Oregon	58,864	3.0	27 North Dakota. . .	158,348	3.6
28 Idaho	10	3.0	28 Idaho	50	3.6
Total	269,881,827	100.0	Total	\$306,891,364	100.0

(a) Includes North Carolina.

COBALT. See NICKEL.

COCAINE HABIT. The most insidious of all drug habits, cocaineism, is becoming more prevalent. It is readily acquired by those who have used the drug in diseases of the nose or throat or for carious teeth, as well as by those who take it as a substitute for opium or alcohol. During the exhilaration that follows its administration, the victim usually can do intellectual work with little fatigue; but the ability for concentration and application becomes weakened, and very soon habits of procrastination are formed. Insomnia, constipation, rapid emaciation, pallor, tremor, and neurasthenia result in all cases, and in the worst examples hallucination of hearing and mental and moral failure supervene. Some patients consume as much as sixty grains of cocaine a day. Immediate withdrawal, with rest in bed, strychnine, and hypnotics constitute the treatment. Several States passed laws in 1900 controlling the sale of cocaine, and in 1901 Virginia took a similar step, after the disclosure of the fact that there were 500 cocaine victims in Roanoke. The habit has become so prevalent in Bengal that efforts are being made to restrict the sale of the drug, which the Hindus use as a substitute for opium. Marfan, of France, in 1901, reported a case of a father who had been a cocaineomaniac for eight years, to whom were born two idiot children.

COCHIN-CHINA, a name formerly applied to a greater part of the Indo-Chinese peninsula, but now generally restricted to the southernmost division of the French colony of Indo-China. The area is estimated at 23,160 square miles, and the population (1899) at 2,323,499. The country is directly administered by French officials under the supervision and control of a lieutenant-governor. It is divided into 21 provinces and 2 municipalities (Saigon, the capital, population 50,000, and Cholou), and is represented in the French parliament by a deputy. In the local budget for 1901, revenue and expenditure balanced at 4,439,500 piastres, and the contribution of France in the budget of 1901 was 320,112 francs. The chief product is rice, of which 608,998 tons were exported in 1900, mostly to China, the Philippine Islands, and Europe. Cotton, silk, hides, fish, and pepper are also exported. The combined imports of Cochin-China and Cambodia, most of whose foreign trade passes through Cochin-China, amounted in 1900 to 66,200,000 francs, and the total exports 111,000,000 francs. The franc is worth 19.3 cents. There is a railroad in operation, 51 miles long, from Saigon to Mytho, and lines are being constructed from Saigon to Tam-Linh and from Tam-Linh to Dji-Ring. See INDO-CHINA.

COCHIN-CHINA DIARRHŒA. This is a disease consisting of severe gastro-intestinal disturbance with an intermittent diarrhœa, accompanied by grave interference with digestion and assimilation of food. It is caused by the presence in the intestines of a small nematode known as *Strongyloides intestinalis*, measuring from 1 to 1.4 micromillimetres in length and from .05 to .075 micromillimetres in breadth. It was first described by Normand in 1876, who found it in the evacuations of French soldiers suffering from Cochin-China diarrhœa. Beavy gave the name *Anguillula stercoralis* to the same parasite. It has been frequently seen in France, Germany, Italy, and Austria. In 1896 the first case of the disease in North America was seen in the person of a Bavarian peasant who immigrated to Baltimore, Md. His case was reported by Strong, who is now director of the U. S. Army Pathological Laboratory at Manila, P. I., and who has seen four cases of infection with this worm at Manila. The parasites, adult and embryonic, together with their eggs, have been found in the glands of Lieberkühn of the intestines, where their presence causes atrophy of the epithelium and infiltration of round cells. The disease is fatal in a few cases. Increased communication between the United States and its tropical territory will probably result in the occurrence of Cochin-China diarrhœa in our seaport towns. Consult Strong, in *Johns Hopkins Hospital Reports*, Vol. X., Nos. 1 and 2, 1901.

COFFEE. The world's crop for the year ending June 30, 1901, is estimated at 14,475,000 bags (of 132.28 pounds), of which Brazil produced 10,027,000 bags, as against 3,548,000 bags in all other countries. According to the *United States Crop Reporter*, "the Brazilian crop, i. e., the one the marketing of which will have been completed by July 1, 1902, is evidently a record crop and is estimated commercially as high as the seemingly extravagant figures of 15,000,000 bags, or about 1,984,000,000 pounds." The production of coffee in Brazil has doubled within a decade and has equaled twice and surpassed once within the past five years the amount that a few years ago constituted the entire world's crop. The imports of coffee into the United States during the calendar year 1901 exceeded all previous records, amounting to 1,072,009,182 pounds, valued at \$70,156,044, as against 785,918,534, valued at \$59,510,771 in 1900. Of the 1901 imports, 951,438,252 pounds were from South America. There are increasing evidences that production is exceeding demand, and there are at present unprecedented supplies in the leading markets.

The exports of coffee from the Territory of Hawaii during the year ending June

30, 1901, amounted to upwards of 2,600,000 pounds, valued at \$311,000. The production of 1901 was greater than that for any preceding year in spite of unprecedentedly low prices. The downward trend of the prices of all grades of coffee since 1895 has brought ruin to hundreds of small planters in Hawaii. Only those continue in the industry who have sufficient capital to tide over years of depression, or who are content to market their product at or below the bare cost of production. In most of the coffee districts the owners of the larger tracts of bearing coffee have ceased to cultivate their plantations and are spending no money on the harvesting of the crop, allowing the berries to go to waste unless they are able to get Japanese or Portuguese laborers to harvest the crop on shares ranging from one-half to four-fifths of the yield. In Porto Rico the coffee plantations have to a considerable extent recovered from the effects of the hurricane of August, 1899, and the crop for 1901 reached nearly its normal amount, but was marketed at very low prices. In the years preceding 1898 the island found a market in France, Spain, Italy, and other European countries for the greater part of its coffee, at prices ranging from 20 to 35 cents a pound. During 1901 the price received averaged about 12 cents.

As the result of a study on the effects of shade in coffee culture, O. F. Cook, of the United States Department of Agriculture, maintains that shade is not generally necessary, even when coffee is grown at low elevations. "The beneficial effects connected with shade arise from the protection afforded against drouth, erosion, and winds. The planting of shade trees for these purposes is accordingly determined by local conditions of climate and soil, and furnishes no reason for the general planting of shade trees. In regions not affected by injurious climatic extremes the planting of shade trees is justified from the cultural standpoint only by the increased fertility imparted to the soil by means of the nitrogen-fixing root tubercles of leguminous species. This view has not been made the subject of experimental demonstration, but it seems to accord with all the facts thus far ascertained." The newly established agricultural experiment station in Porto Rico has undertaken the investigation of this and other problems connected with coffee culture.

COINS, VALUE OF FOREIGN. The coins and coinage of the United States will be found in the article *United States* (paragraph Coinage). The production of gold and silver will be found under the articles *Gold* and *Silver*. Under the article *Money* will be found the world's stock of gold, silver, and uncovered paper. The following tables show the official valuation of foreign coins by the United States Treasury; first, in the case of countries with fluctuating currencies; and, second, in the case of countries with fixed currencies, giving their semi-annual variations during the year 1900 and their quarterly valuations in 1901.

A.—Countries with Fluctuating Currencies.

Countries.	Monetary Unit.	1900.		1901.			
		Jan. 1.	July 1.	Jan. 1.	April 1.	July 1.	Oct. 1.
Bolivia	Silver boliviano	\$0.42.7	\$0.43.8	\$0.46.8	\$0.45.1	\$0.43.6	\$0.42.8
Central America	Silver peso .....	.42.7	.43.8	.46.5	.45.1	.43.6	.42.8
	Amoy tael .....	.69.1	.70.9	.75.7	.72.9	.70.5	.69.1
	Canton tael .....	.68.9	.70.7	.75.5	.72.7	.70.3	.68.9
	Chefoo tael .....	.66.1	.67.8	.72.4	.69.7	.67.4	.66.1
	Chinkiang tael .....	.67.5	.69.3	.74	.71.2	.68.8	.67.5
China	Fuchau tael .....	.64	.65.6	.70.1	.67.5	.65.2	.64
	Halkwan tael .....	.70.3	.72.1	.77.1	.74.2	.71.7	.70.4
	Hankau tael .....	.64.7	.66.3	.70.9	.68.2	.65.9	.64.7
	Hongkong tael	(*)	(*)	(*)	(*)	(*)	(*)
	Ningpo tael .....	.66.5	.68.2	.72.8	.70.1	.67.8	.66.5
	Niuchwang tael .....	.64.8	.66.5	.71	.68.4	.66.1	.64.8
	Shanghai tael .....	.63.1	.64.8	.69.2	.66.6	.64.4	.63.2
	Swatow tael .....	.63.9	.65.5	.70	.67.4	.65.1	.63.9
	Takao tael .....	.69.6	.71.4	.76.2	.73.4	.70.9	.69.6
	Tientsin tael .....	.67	.68.7	.73.4	.70.7	.68.3	.67
Colombia	Silver peso .....	.42.7	.43.8	.46.8	.45.1	.43.6	.42.8
India	Silver rupee† .....	.20.3	.20.8				
Mexico	Silver dollar .....	.46.4	.47.6	.50.9	.49	.49	.46.4
Persia	Silver kran .....	.07.9	.08.1	.08.6	.08.3	.08.3	.07.9
Peru	Silver sol .....	.42.7	.43.8				

* The "British dollar" has the same legal value as the Mexican dollar in Hongkong, the Straits Settlements, and Labuan.

† The sovereign is the standard coin of India, but the rupee is the money of account.

B.—Countries with Fixed Currencies.

The following official (United States Treasury) valuations of foreign coins do not include "rates of exchange."

Countries.	Standard.	Monetary Unit.	Value in U.S. gold.	Coins.
Argentine Republic...	Gold and silver.	Peso.....	\$0.96,5	Gold—argentine (\$4.82,4) and ½ argentine; silver—peso and divisions.
Austria-Hungary*....	Gold.....	Crown.....	.20,3	Gold—20 crowns (\$4.05,2) and 10 crowns.
Belgium.....	Gold and silver.	Franc.....	.19,3	Gold—10 and 20 franc pieces; silver—5 francs.
Brasil.....	Gold.....	Milreis.....	.54,6	Gold—5, 10 and 20 milreis; silver—¼, 1, and 2 milreis.
British North America (except Newfoundland).....	...do.....	Dollar.....	1.00	
British Honduras.....	...do.....	...do.....	1.00	
Chile.....	...do.....	Peso.....	.96,5	Gold—escudo (\$1.25), doubloon (\$3.65), and condor (\$7.30); silver—peso and divisions.
Costa Rica.....	...do.....	Colon.....	.46,5	Gold—2, 5, 10, and 20 colons; silver—5, 10, 25, and 50 centismos.
Cuba.....	Gold and silver.	Peso.....	.92,6	Gold—doubloon (\$5.01,7); silver—peso (50 cents).
Denmark.....	Gold.....	Crown.....	.26,8	Gold—10 and 20 crowns.
Ecuador†.....	...do.....	Sucre.....	.48,7	Gold—10 sucres (\$4.8665); silver—sucre and divisions.
Egypt.....	...do.....	Pound (100 plasters)...	4.94,3	Gold—10, 20, 50, and 100 plasters; silver—1, 2, 10, and 20 plasters.
Finland.....	...do.....	Mark.....	.19,3	Gold—10 and 20 marks (\$1.93 and \$3.85,9).
France.....	Gold and silver.	Franc.....	.19,3	Gold—5, 10, 20, 50, and 100 francs; silver—5 francs.
Germany.....	Gold.....	Mark.....	.23,8	Gold—5, 10, and 20 marks.
Great Britain.....	...do.....	Pound sterling.....	4.86,6½	Gold—sovereign (pound sterling) and half sovereign.
Greece.....	Gold and silver.	Drachma.....	.19,3	Gold—5, 10, 20, 50, and 100 drachmas; silver—5 drachmas.
Haiti.....	...do.....	Gourde.....	.96,5	Silver—gourde.
India.....	Gold.....	Rupee.....	.32,4	Gold—sovereign (\$4.8665); silver—rupee and divisions.
Italy.....	Gold and silver.	Lira.....	.19,3	Gold—5, 10, 20, 50, and 100 lire; silver—5 lire.
Japan‡.....	Gold.....	Yen.....	.49,8	Gold—1, 2, 5, 10, and 20 yen.
Liberia.....	...do.....	Dollar.....	1.00	
Netherlands.....	Gold and silver.	Florin.....	.40,2	Gold—10 florins; silver—½, 1, and 2½ florins.
Newfoundland.....	Gold.....	Dollar.....	1.01,4	Gold—\$2 (\$2.02,7).
Peru§.....	...do.....	Sol.....	.48,7	Gold—libra (\$4.8665); silver—sol and divisions.
Portugal.....	...do.....	Milreis.....	1.08	Gold—1, 2, 5, and 10 milreis.
Russia.....	...do.....	Ruble.....	.51,5	Gold—imperial (\$7.718) and ¼ imperial (\$3.80); silver—¼, ½, and 1 ruble.
Spain.....	Gold and silver.	Peseta.....	.19,3	Gold—25 pesetas; silver—5 pesetas.
Sweden and Norway.....	Gold.....	Crown.....	.26,8	Gold—10 and 20 crowns.
Switzerland.....	Gold and silver.	Franc.....	.19,3	Gold—5, 10, 20, 50, and 100 francs; silver—5 francs.
Turkey.....	Gold.....	Plaster.....	.04,4	Gold—25, 50, 100, 200, and 500 plasters.
Uruguay.....	...do.....	Peso.....	1.03,4	Gold—peso; silver—peso and divisions.
Venezuela.....	Gold and silver.	Bolivar.....	.19,3	Gold—5, 10, 20, 50 and 100 bolivars; silver—5 bolivars.

* The gold standard went into effect January 1, 1900. Values are still sometimes expressed in the florin, which is worth 2 crowns.

† Gold standard adopted in November, 1900.

‡ Gold standard adopted October 1, 1897.

§ Gold standard adopted October 13, 1900.

COKE. The production of coke in 1900 was 20,533,348 short tons, valued at \$47,443,331. This value was more than double that of 1897. The product in 1900 came from 22 States and Territories, and was produced by 388 establishments from 32,113,543 short tons of coal, the latter thus yielding 63.9 per cent. of coke. The average value of the coke per ton was \$2.31, although in the early part of the year exceptionally high figures were reached in some districts, such as that of Connells-ville, where furnace coke sold for \$4.00 to \$4.25, and foundry coke from \$4.25 to \$4.50 per ton. These prices had dropped in the summer to nearly one-half, but rallied later. The new coke area of Fayette County, Pennsylvania, promises to become one of the most important districts in the State. At the close of 1900 there were 8,817 more coke ovens in operation than in 1899, while 5,804 additional ones were in the course of construction. The use of by-product coke ovens, which was introduced

into the United States by the Solvay Process Company in 1891, is rapidly spreading, so that at the end of 1900 there were 1,085 of these ovens in use and 1,096 more building. Some of these by-product plants are very large, one at Everett, Mass., having 400 ovens, to which 800 were to be added; another of similar size is located at Sydney, Cape Breton, and a 280-oven plant at Johnstown, Pennsylvania. They are proving very successful, as a ready sale is found for the by-products. According to the United States Geological Survey, *Mineral Resources of the United States*, 1900, by products are tar, ammonia liquor, and ammonium sulphate. The ammonia is obtained as a weak liquid, containing ammonium sulphate and ammonium carbonate. It is concentrated to a crude impure liquid with 20-25 per cent. ammonia and 40-45 grammes per liter of hydrogen sulphide, and 100-120 gr. per liter of carbon dioxide. This is sometimes sold as ammonia liquor or worked up into ammonium chloride, ammonium carbonate, ammonium sulphate, or ammonium hydrate. Cyanogen has recently been discovered to be a constituent of these by-product gases, and can be removed by treatment with an alkaline salt. The cyanogen is converted into a ferrocyanide of potash or soda and separated by crystallization, after which it may be refined. The amount of cyanogen obtained varies with the volatile matter of coal, the percentage of nitrogen in the gas and the temperature of the ovens.

COKE OVEN GAS. See GAS, FUEL AND ILLUMINATING.

COLLEGE ENTRANCE EXAMINATIONS. See UNIVERSITIES AND COLLEGES.

COLLEGES. See UNIVERSITIES AND COLLEGES.

COLLEGES, GIFTS TO. See UNIVERSITIES AND COLLEGES.

COLOMBIA, a republic of South America, occupies the northwestern part of the continent between the Caribbean and the Pacific. The capital is Bogotá.

Area and Population.—The aggregate area of the 9 departments comprising Colombia has been estimated at 513,938 square miles; it is not unlikely that this estimate is too large. There are boundary disputes with Brazil, Ecuador, and Peru. The boundary dispute with Costa Rica was settled on September 12, 1900, through the arbitration of the president of the French republic; the decision was less satisfactory to Costa Rica than to Colombia. The estimated population is somewhat over 4,000,000.

Government.—The chief executive is a president, who is elected for a term of six years and is assisted by a responsible ministry. The legislative power devolves upon a congress of two houses, the Senate and the House of Representatives. The president elected for the term beginning August 7, 1898, was Señor M. A. San Clemente, a Conservative; by the *coup d'état* of July 31, 1900. He was superseded by the vice-president, Señor José Manuel Marroquín. By the constitution of August 4, 1886, which was adopted through the influence of the Conservatives, the federal power was strengthened, the several States losing their sovereignty and the governors becoming appointees of the president. The strength of the regular army is determined at each session of Congress, but in case of war the president may raise such forces as are necessary. There is practically no navy.

Finance.—The monetary standard is silver and the unit of value the peso, worth in United States money 45.1 cents on October 1, 1900, and 42.8 cents on October 1, 1901. There is a large paper circulation, the paper peso in 1900 being worth about 28 cents. The chief source of revenue is customs. The estimated revenue and expenditure for the biennial period were 34,361,000 pesos and 35,771,013 pesos respectively; for the period 1899-1900 the estimates balanced at 29,918,640 pesos. The external debt in the middle of 1900 was reported at £2,747,250 (\$13,369,492); the internal debt in 1899 amounted to 11,359,074 pesos.

Industries and Commerce.—Mining and agriculture are the principal industries. The soil of Colombia is fertile, but only a small portion of it is under cultivation. The most valuable mineral exploitation at present is that of gold, silver, and emeralds. The principal crop is coffee; others of importance are sugar, cacao, and tobacco. The raising of live-stock is important. The leading imports include food-stuffs and liquors, cotton textiles, and iron and steel goods. The total imports and exports in gold pesos (worth approximately one dollar in United States money) were valued in 1897 at 18,136,598 and 16,820,411 respectively; in 1898, 11,346,028 and 19,735,733 respectively. The export trade has been chiefly with Great Britain, the United States, France, Germany, and Venezuela, named in order of importance. The transit trade between the free ports, Panama and Colon, is not included in Colombia's commerce. The coffee export in 1898 amounted to 39,100,102 kilogrammes. The export of rubber from Colombia between 1855 and the middle of 1900 has been reported at 94,624,743 pounds. The greatest quantity shipped in any five-year period was in 1871-75, amounting to 26,859,618 pounds. From that time the export has declined to 4,299,837 pounds in 1896-1900. The greatly reduced production is due in part to the practice of felling rather than tapping trees. In the fall of 1901 com-

mercial depression—induced by two years of civil war—seemed to have reached the lowest possible limit. Through the scarcity of labor the greater part of the coffee crop was not gathered, and through lack of transportation large quantities of the last and previous crops remained on the plantations or at the river ports. The same distress prevailed with regard to hides and other important products, and there seemed to be no indications of early relief.

Communications.—Roads are few and in wretched condition, and usually traffic is carried on as far as possible by river navigation. The Magdalena and its tributaries afford about 1,000 miles of navigable water. In 1901 the reported length of railways in operation was 648 kilometres (402 miles); a number of lines were projected and some under construction. The Panama railway, 48 miles in length, is owned by an American corporation, with headquarters in New York. The total earnings of this line for 1900 were \$2,655,196, an increase of \$460,152 over 1899; the net gain in income over that year, however, was \$151,532. In 1900 westbound freight amounted to 153,758 tons and eastbound freight 203,619 tons, while the passengers going east and west respectively were 41,576 and 41,656.

HISTORY.

Civil War and the Trouble with Venezuela.—During the year 1901 the revolt against the Conservative government in Colombia took on an international aspect from the alliance of the Liberal insurgents in that country with the Castro government in Venezuela. War between the de facto governments of the two countries seemed inevitable, but down to the end of the year, peace had officially at least been maintained. Late in December, 1900, the principal leader of the revolutionists, General Uribe-Uribe, fled from the country and visited the United States. During his absence the insurrection seemed to have almost died out, the rebels holding only the province of Tolima, south of Bogotá. In June it was reported that at a meeting in New York, an agreement had been reached between General Uribe-Uribe and Dr. Silva, the Colombian secretary of state, by which the principal demands of the Liberals were to be conceded, and General Uribe-Uribe was to urge his companions to disband. The actual terms of the agreement were never made public, and it is doubtful if there was any attention paid to them by either party in Colombia. In fact, it seemed unlikely that General Uribe-Uribe himself, although he asserts that he is not a revolutionist but a political reformer, would have been satisfied with anything short of the complete overthrow of the existing Colombian government. It was at this point, in the midsummer, before time enough had elapsed to prove whether the New York agreement was indeed a settlement, that the struggle assumed an international character. To understand how this came about it must be kept in mind that the unrest and civil war that has prevailed for some time in the northern countries of South America is not so much a conflict between nations as a struggle of parties; as one writer has put it, a revolt of "the genius of free institutions against the spirit of despotism." The dominant parties in Ecuador and Venezuela are the Liberals, while the government of Colombia since 1885 has been in the hands of the Conservative or clerical party. Quite naturally the Venezuelans and Ecuadorian Liberals have looked with sympathy on the attempt of Uribe-Uribe and his fellow Liberals in Colombia to overthrow the existing despotism in that country, not only because the principles for which he contends are those upon which their own constitutions rest, but because the existence of a conservative government in a neighboring state aiding and harboring the discontented whom they have driven from power, is an actual menace to the continuation of Liberal government in their own territories. The Clerical-Conservative government of Colombia, on the other hand, is quite as decidedly disposed to favor the opposition elements in Ecuador and Venezuela, and realizes that it will never be secure while there is a Liberal republic on either hand, and another, Nicaragua, on the north. This explains, therefore, the new phase of the war that began in the latter part of July, with the crossing into Venezuela of a force of 6,000 men under General Gailbiros, a former supporter of General Andrade, the Conservative president of Venezuela, whom President Castro expelled from the country in 1899. The Colombian government hastened to disavow any connection with the expedition, which it was said consisted of Venezuelan Conservatives, discontented with the Castro government, and Colombian volunteers in sympathy with them. This expedition, however, and another which followed it in August, reports of which were no doubt purposely colored by Castro served as an excuse for Venezuela's withdrawing the exequaturs of Colombian consuls within her boundaries and massing an armed force of 9,000 men on the frontier. On August 19, Castro was reported to have sent both men and arms to aid Uribe-Uribe, who had returned to the country and assumed command of the insurgent forces, declaring that his agreement made with Silva in New York had not been kept by the Colombian government. The attitude of Venezuela was considered so threatening that the United States took a hand, dispatching war-ships to guard either side of the isthm-

mus of Panama, and following up the action on August 24 by a note to President Castro, offering mediation, and calling his attention to the fact that by a treaty made in 1846 with New Grenada, as Colombia was then called, the United States is pledged to guard not only the neutrality of the Isthmus of Panama, but also the sovereignty of Colombia in that region. During September the situation remained practically unchanged. A number of so-called battles were fought between the government and the Liberal revolutionists on Colombian soil, in most of which the latter were apparently successful, receiving aid not only from Venezuela, but from Ecuador, Nicaragua and Costa Rica, although the governments of these countries continued to assert their neutrality. The month ended with a series of actual engagements between Venezuela and Colombian government troops along the frontier, and General Uribe-Uribe, with an army of Liberals, said to be 12,000 strong, marching toward Panama. During October there was little change, the most important military occurrence being the defeat of an insurgent force under General Marin, which was advancing upon Bogotá. Both Castro and Uribe-Uribe issued statements defining their positions. Castro's declaration, while regretting the present situation, asserted that should war follow, it would be the fault of Colombia because of the expedition of General Gailbiros into Venezuelan territory in September, though this movement has, as above stated, been disclaimed by Colombia. The statement of Uribe-Uribe showed him to be a true political idealist, whose aims did not stop with the reestablishment of free institutions in Colombia, but looked toward a union of the three States of Colombia, Ecuador and Venezuela into a single Liberal republic, similar to that in which they had originally been formed after throwing off the Spanish yoke in the first quarter of the nineteenth century.

Early in November there was a cessation of hostilities along the Venezuelan-Colombian frontier on account of the rains, and the scene of fighting was transferred to Panama. The activity of the Liberals increased, and on November 19 they made an unexpected attack upon Colon, which after a weak defense, capitulated. In pursuance of treaty obligations marines were landed from the United States gunboat *Machias* at Colon and from the battleship *Iowa* at Panama on the Pacific side, and through their efforts traffic was kept open cross the isthmus. On November 28 Colon was recaptured by a Colombian government force under General Alban. During the month a strong movement developed among Colombian Conservatives to call upon Dr. Reyes, then minister to France, and holding the position of "designado" or president-elect, to take the presidency immediately, thus superseding Vice-President Marroquin, who has been acting president since the forced retirement of President San Clemente in 1900. Marroquin, who is an ultra-Conservative, has driven out many of the best men in the party, causing some of them to go even to the extent of espousing the Liberal cause. The more moderate men in the party believe that the accession of Dr. Reyes will be followed by a compromise with the Liberals that will secure peace to the country. By the end of December, however, this change had not been effected, and the relations of the parties and of Colombia and Venezuela remained unchanged.

COLONIES. Colonies and other dependencies are treated under their own titles. Discussion of the policies regarding colonies and similar territory will be found under FRANCE (paragraph Colonial Policy); GERMANY (paragraph Colonies); CUBA; PHILIPPINES; PORTO RICO; and AFRICA.

COLORADO, a western State of the United States, has a land area of 103,645 square miles. The capital is Denver. Colorado was admitted to the Union August 1, 1876. The population in 1900 was 539,700, while in June, 1901, as estimated by the government actuary, it was 554,000. The two largest cities and their populations in 1900 were: Denver, 133,859; and Pueblo, 28,157.

Finances.—The receipts of the treasury for the year ending December 31, 1901, were \$1,515,000; expenditures, \$1,551,000; the balance on hand January 1, 1902, was \$455,000. The amount of the State debt was not changed during the year. The State has \$1,437,000 invested in State securities. The tax rate for the year was 4 mills per \$1.00 and the total value of State property as returned for taxation was \$465,000,000.

Industries.—Although the chief industries of Colorado are mining, stock-raising and agriculture, the census reports of 1900 indicated a steady growth in manufacturing interests since 1870. In that time, the population increased from 39,864 to 538,555, or 1,251 per cent., while the average number of industrial wage-earners advanced from 876 to 24,725 or 2,722.5 per cent., embracing in 1900 4.6 per cent. of the entire population. The amount of actual capital invested in 1900 in mechanical industries, exclusive of capital stock, was \$62,825,472, the gross value of the products, inclusive of material re-used in the process of manufacture, was \$102,830,137, most of which is derived from the products of smelting and refining. The situation of Colorado in the centre of the Rocky Mountain region has favored the growth of its manufactures. Of this region, Denver is the great railroad and distributing

centre. The distance of Colorado from the east and the lack of water communication have favored the local producers of articles whose cost is largely increased by freight charges. Abundant fuel is provided by coal mines, the State ranking seventh in coal production in 1900. Denver is the market of the stock-raising region of the Rocky Mountains, the product of the slaughtering and meat-packing industry of 1900 being valued at \$3,562,357, as against \$2,128,030 in 1890. The smelting and refining of gold, silver, copper and lead ores is the most important industry of the State, the value of the product in 1900 being \$44,625,305. Colorado leads in the production of gold and silver ores, the value of the product of its lead smelters and refineries constituting 23.2 per cent. of the total value of the product of the United States. Iron and steel manufactures are next in importance, the products in 1900 being valued at \$6,108,295. The growth of this industry is due largely to the abundant local supply of coal and iron ore. The making of mining machinery and the construction and repair shop work of steam railroads are large industries with products in 1900 valued respectively at \$3,986,915 and \$3,141,602. The output of coke made possible by coal mining and stimulated by demands of the smelters was valued in 1900 at \$1,726,341. Flour milling and the making of malt liquors with products valued respectively at \$2,042,863 and \$4,528,062 have both been stimulated by the increased production of cereals, the wheat crop of 1900 being more than double that of 1890. Fruit canning and beet sugar manufacture are industries of increasing importance, owing to the extensive irrigation of recent years.

Constitutional Amendments.—Several important amendments to the constitution were directed by the legislature to be submitted to the electorate at the next general election. These were as follows: First, that once in four years the electors of each county might vote to exempt or not to exempt personal property and improvements on land from taxation for county, town, school and road purposes; but land exclusive of improvements and franchises on public ways could not be so exempted. The constitution as it stands prohibits a tax for State purposes of more than six mills on all classes of property; while by the proposed amendment franchises and unimproved land may be taxed up to six mills for State purposes, but personal property and improvements on land cannot be taxed more than four mills. Second, that Denver and other cities of the first and second class be given home rule. Under the present constitution, the police and public works board are now appointed by the governor, and Denver has been clamoring for control over its own affairs. It is claimed, however, by the Denver press that the proposed amendment will delay the desired reformation by submitting the question of Denver home rule to the votes of persons who are not directly interested. Third, that any man or woman over twenty-one years of age, a citizen of the United States and a resident in Colorado for one year, might vote at all elections. The existing provision of the constitution prescribes that any male person over twenty-one years of age may vote in Colorado who has resided in the State for six months, but that the legislature may also extend the suffrage to women. The Colorado legislature has already extended the suffrage to women, so that the proposed amendment will merely act to make the suffrage contingent upon one year's residence in the State instead of, as at present, six months. Fourth, that the legislature may by law limit to eight hours per day the hours of employment of all workers in mines, blast furnaces and smelters, or in other branches of industry deemed dangerous to life or injurious to health. The direct cause of this amendment was a decision by the Supreme Court of the State declaring unconstitutional a law passed by the legislature in 1899, restricting the hours of labor in mines to eight hours per day. The court held in this case that the law violated the provisions of the Colorado constitution providing that no special law should be enacted where a general one could be made applicable, and that no special or exclusive privilege or immunity whatsoever should be granted to any person or persons. In order, therefore, to reenact the law concerning miners, the constitutional amendment was proposed. Fifth, that the terms of district attorney and county judge should be increased from three to four years.

Labor Laws.—Besides the proposed constitutional amendment, limiting the hours of work for miners, several important laws were passed by the legislature in the interest of workmen. A law of 1897, prohibiting blacklisting and boycotting was repealed; for it was said that in practice, this law, while stopping boycotting, had no influence at all on blacklisting, and acted therefore solely in favor of employers. A resolution passed by the legislature declared it to be the sense of that body that all officers and purchasing agents of the various State institutions should wherever possible give preference to goods manufactured or produced in the State. Another law enacted that no railroad company should permit anyone of its employees who had worked for sixteen consecutive hours to go on duty again until he had had at least sixteen hours' rest. An act similar to that passed by many of the western mining States forbade any private corporation except railroad corporations and except corporations exclusively operating ditches, canals and reservoirs to pay their

employees in token, scrip or in any other article of value except money, and the wages must be paid in money semi-monthly. Any contract made between employer and employee in violation of this law was to be null and void. And if any corporation gave over its work to any contractor, then the obligations made by the law should fall upon the contractor, but the corporation should, nevertheless, be held responsible in case of default by the contractor. Damages recovered by employees from corporations for violation of the act should include a reasonable attorney's fee. Two curious features of this law were, first, that under it payments had to be made semi-monthly and could not be made weekly or at any other regular periods except that specified, and secondly, that the corporations operating ditches and canals who were exempted from the provisions of the law employed almost exclusively Chinamen and Italians, and not citizens of the United States.

Other Legislative Acts.—Several memorials were addressed by the legislature to Congress. One of these, while hoping for the reascendency of the American shipping, deprecated the ship subsidy bill on the ground that it would be class and special legislation; another denied the right of Congress in the executive to demonetize silver, and demanded that silver should be reinstated in the national currency; and still another applied to Congress under the fifth article of the constitution to propose a convention for the amendment of the constitution and the election of United States Senators by a direct vote. A resolution was passed declaring that as Kansas had adopted a resolution instructing its attorney-general to bring suit against Colorado to prevent the further diversion of the waters of the Arkansas River for irrigation purposes, and as Colorado had an unquestionable right to continue to divert these waters, the attorney-general should be instructed to defend the Kansas suit. An act was passed appointing a commissioner to act in conjunction with commissioners to be appointed by the Department of the Interior at Washington and by New Mexico to establish the correct boundary line between New Mexico and Colorado. The use of the United States flag for advertising purposes was forbidden. An act of 1897 abolishing the death penalty was repealed, it being thought that the number of homicides had largely increased since the enactment of that law. By the new law of 1901, the jury was authorized to fix either death or imprisonment for life as the penalty for murder in the first degree; provided, however, that no person under eighteen years of age should be sentenced to death, and provided that no person should be sentenced to death on circumstantial evidence alone. Educational enactments provided that in the public schools, two lessons should be given each week on the subject of the humane treatment of animals, and that truant schools might be established in cities of over 25,000, at which children were to be kept until they were fourteen years of age who had been guilty of wilful and "habitual" truancy, and who had regularly violated the rules of the schools which they attended. Street car railways were required to provide inclosures on the cars for their motormen, and apparently the railways were required to keep the inclosures all the year round, or at any rate whenever there was any inclement weather. The tax on insurance companies was raised from 2½ per cent. to 3 per cent. of the gross premiums. A noteworthy incident of the session of the legislature was a rule adopted in the House out of courtesy to Mrs. Hertz, its one woman member, forbidding the use of tobacco in the chamber. The speaker found it difficult to enforce the rule, but in a discussion of the subject, Mrs. Hertz declared that tobacco made her head ache.

State Officers.—Governor, James B. Orman, Democrat, elected for two years; term expires in January, 1903; lieutenant-governor, David C. Coates; secretary of state, David A. Mills; treasurer, James N. Chipley; auditor, Charles W. Cronter; attorney-general, Charles C. Post; adjutant-general, C. F. Gardner; superintendent of education, Helen L. Grenfell. Supreme Court.—Chief justice, John C. Campbell, Republican, term nine years; expires in January, 1903; associate justices, Robert W. Steele, Fusionist, and William H. Gabbert, Democrat.

Congressional Representatives (57th Congress). In the House—John F. Shaforth, from Denver, and John C. Bell, from Montrose—both Fusionists. In the Senate—Henry M. Teller, Silverite (until 1903), from Central City, and Thomas M. Patterson, Democrat (until 1907), from Denver.

COLORED METHODISTS. The number of negro Methodists increased considerably during 1901, and now exceeds 1,500,000. They not only are included in the distinct colored organizations maintained, but also constitute a part of other Methodist churches, some conferences of the Methodist Episcopal Church, South, notably, being comprised almost exclusively of a colored membership. The colored Methodist bodies, in the interests of their own race, maintain a number of colleges, have progressive publishing activities, and carry on an enterprising missionary propaganda. The more important African organizations are: African Methodist Episcopal Church (founded 1816), with 6,179 ministers, 5,715 churches, and 698,354 communicants; African Methodist Episcopal Zion Church (founded 1820), with 3,475 ministers,

2,955 churches, and 537,337 communicants; Colored Methodist Episcopal Church (founded 1870), with 2,061 ministers, 1,433 churches, and 204,972 communicants.

COLUMBIA UNIVERSITY. On October 7, 1901, Dr. Seth Low (*q.v.*) resigned the presidency of Columbia University in consequence of his nomination for mayor of New York on the Fusion ticket opposing that of Tammany Hall, and Dr. Nicholas Murray Butler (*q.v.*), dean of the school of philosophy, was chosen acting-president. At the same time President Low presented to the trustees his annual report for the academic year ending June 30, 1901. Pursuant to the newly established relations with Teachers College, the university will grant the degree of B.S. to graduates of the college who complete a professional course that has been offered, which is parallel, for example, to the course in chemistry leading to the same degree, and representing two years of general culture and two of professional work. Teachers College, on its part, has placed its entrance requirements to the level both of Columbia College and of the Schools of Applied Science. For its purely professional work, Teachers College will continue to confer a diploma rather than a degree.

In view of the success of the 1900 summer school, that form of university activity has been made a permanent feature of the university's work. The commencement of 1901, in addition to being the first graduation of students of Barnard and Teachers colleges under the new relation of those institutions with Columbia, was notable for the largest number of degrees conferred in the history of the university, involving the recognition of 661 students; for the conferring of all of the degrees in English, for the first time, and the disappearance of Latin from this function; and for the completion in temporary form of the great memorial dining-room in University Hall. On May 1, 1901, Miss Laura D. Gill, Smith '81, was installed as dean of Barnard College. Columbia's arrangement whereby public lectures have been maintained during the winter months at the Metropolitan Museum of Art and the American Museum of Natural History, has been so modified as to render a more distinctive service to the community. From 1902 lectures will be delivered at but one museum a year, relating to art at the Metropolitan Museum, and to science at the American Museum, which will be given by distinguished authorities. A corresponding change will be made at Cooper Union. In relation to the permission accorded in 1900 to students to enter the college without Latin as well as without Greek, it is of interest to observe that this permission so to enter, upon condition of taking the subject within the college, has proved to be a distinct encouragement to the study of the language. The president reports that the enlargement and increased flexibility of the curriculum during the past decade has been accomplished without departing from the old ideals too radically. "Some knowledge of at least one classical language is still required for the degree of Bachelor of Arts, and the curriculum demands almost as much required work as it did ten years ago. But great flexibility is given to the curriculum by permitting the student to take his required work pretty much at his pleasure, instead of compelling him to concentrate it within the first two years of his course." This system seems better to the faculty than an absolutely free election, such as prevails at Harvard and Cornell, on the ground that it insures to every student "such a liberal education as may be developed around a specified core of prescribed studies. On the other hand, it permits to a great degree the privilege of concentrating one's studies in a given department from the very beginning. It seems to the faculty better, also, than the group system, because it is more flexible." Practically, the curriculum in vogue at Columbia is the group system on a self-regulating basis.

Columbia received about \$354,120 in gifts and bequests during the academic year. The most important gift was an anonymous one of \$100,000 for the establishment of a department of Chinese languages, literatures, religion, and law, and especially for a chair to be known as the Dean Lung Professorship of Chinese. Later in 1901 it appeared that General Carpenter was the donor of this gift. President Low also reports the gift of \$12,000 from Dean Lung himself. "I doubt," said the president, "whether the history of education supplies the record of any similar gift from a Chinaman to a university of the western learning." Among gifts for permanent investment was one of \$40,000 from William Earl Dodge, for the erection of Earl Hall, the house of the Y. M. C. A., and \$100,000 from the associate Alumni for permanent investment. A new building representing an investment of over \$300,000 has been completed for the Horace Mann School, a school of observation connected with Teachers College. The Speyer School, the Teachers College experimental school, will be housed in a new building by October, 1902. A dormitory for Teachers College is being erected as a business venture by friends of the college.

The library, which numbers about 311,000 volumes, was increased during the year by 17,559 books, including several important collections. All departments showed an increase in attendance, and the faculty increased from 350 to 379. The total student attendance, omitting 579 students in the summer session of 1901, and omit-

ting names duplicated, was 3,524, distributed as follows: college, 476; law, 423; College of Physicians and Surgeons, 797; schools of applied science (mines, chemistry, engineering, and architecture), 513; non-professional graduate schools (political science, philosophy, pure science), 782; Barnard College, 301; Teachers College, 528. In addition, 679 students received instruction through the Teachers College extension courses. See UNIVERSITIES AND COLLEGES, and PSYCHOLOGY, EXPERIMENTAL.

COMETS. See ASTRONOMICAL PROGRESS.

COMMERELL, Sir JOHN EDMUND, V.C., British admiral, died in London, May 21, 1901. He was born in London, January 13, 1829, and entered the navy in 1842. Serving through the first China war and in various campaigns in the East, he was promoted to lieutenant in 1848. From that time continuously, until he was sent to parliament in 1885, he served in nearly every part of the world, rising in rank to vice-admiral. Throughout his career he was deeply interested in the development of the British navy, and was intrusted with the command of the new turret ship *Monarch* in 1869; one of his first duties as commander of that vessel being to carry home to the United States the body of the great philanthropist, George Peabody. Admiral Commerell was known to stand very close to the Court and represented the sovereign frequently at foreign manœuvres. While in parliament he did much to achieve the passage of the Naval Defense Act, for which he was rewarded with the rank of Admiral of the Fleet (1892).

CONGO FREE STATE, a country of central Africa under the sovereignty of Leopold II., King of the Belgians, has an estimated area of 900,000 square miles and a population, according to the official estimate of 1896, of 30,000,000. Notwithstanding the efforts made in recent years by the Congo authorities to encourage immigration, the white population in 1901, according to a report published in November, was only 2,204, including all officials and army officers; of the total, 1,318 were Belgians, 170 Italians, 115 English, 114 Dutch, and 107 Swedes. Portuguese, German, French, Danes, and Americans were represented in smaller numbers. Boma, the capital, with 437 Europeans has the largest white population of any town.

Government, etc.—Under the provisions of the Berlin congress of 1885, the Congo Free State is placed under the sovereignty of Leopold II., who governs the country through a cabinet at Brussels and a governor-general at Boma. The fourteen districts are administered by Belgian commissioners, who are assisted by various civil and military officials. In 1889 the king bequeathed his sovereign rights to Belgium, and on July 3, 1890, the Free State made an agreement with Belgium whereby the latter had the option of annexation after a period of ten years. (See the paragraph Proposed Annexation.) The army consists of 23 regiments of native troops, with an effective strength of nearly 12,000 men, commanded by European officers. For 1900 the estimated revenue, which accrues largely from the state domain, customs, and transport dues, was 26,256,500 francs (the franc equals 19.3 cents), and the estimated expenditure, largely for the departments of finance and the interior, 27,731,254 francs. For 1901 the estimates were 28,700,000 francs for revenue and 28,549,000 francs for expenditure. The public debt is reported at about 116,200,000 francs. In November, 1901, it was announced that the Brussels administration of the Free State was about to float a loan of £2,000,000 (about 50,000,000 francs) for the construction of important public works, including railways.

Production and Commerce.—The most important products are rubber, ivory, palm-kernels, palm-oil, and ground-nuts. Various minerals occur, but mining has not been developed. Notwithstanding the great difficulties of transportation commerce has advanced rapidly. In the special trade in 1895 the imports amounted to 10,685,848 francs, and the exports 10,943,019 francs; in 1899, the special imports and exports were valued at 22,325,847 francs and 36,067,959 francs respectively; in 1900, 24,724,110 francs and 47,377,400 francs respectively. The general commerce in 1900 amounted to 31,803,213 francs for imports and 51,775,980 francs for exports. The leading imports in 1899 were valued in francs as follows: Tissues and clothing, 5,147,610; steamers and machinery, 4,197,129; foods, 3,887,912; and metals and metal wares, 1,667,391. The chief exports for the same year were: Rubber, 28,100,917; ivory, 5,834,620; palm-nuts, 1,293,413; and palm-oil, 734,511. Of the imports nearly three-fourths came from Belgium, and over five-sixths went to that country.

Communications.—The Congo River is navigable as far as Matadi, a town 27 miles above Boma and 112 miles from the Atlantic. From Matadi to Stanley Pool (Leopoldville) there are numerous rapids, and communication is effected by a railway about 250 miles in length. Above Stanley Pool there are about 1,000 miles of navigable water. Besides a small flotilla of sailboats, the government has 6 steamboats below the rapids and 26 above. A short line of railway—20 miles—is in operation between Boma and Mayumbe. In November, 1901, the Congo administration authorized the formation of a company which proposed to construct in the region of the Upper Congo nearly 1,000 miles of railway, a part of which is to connect the Congo River with the region

of the great lakes. It is not expected that these railways will be completed within eight or ten years. There are reported 795 miles of telegraph lines. It was announced in the spring of 1901 that the telegraph will ultimately be extended to Lake Tanganyika, where it will connect with the system of German East Africa.

Proposed Annexation.—The convention of 1890, under which Belgium acquired the right of annexation after ten years, expired June 3, 1901. Under this convention also the Free State received from Belgium a loan of 25,000,000 francs without interest during the ten-year period. The question of annexation came up for discussion in the Belgian chambers in the spring of 1901. The increasing prosperity of the state was used as an argument for annexation. The opponents of the plan, however, maintained that this prosperity is only apparent, and pointed out that the trade with the Free State, as compared with Belgian trade with civilized countries, is comparatively small; they added, moreover, that the "prosperity" was due to a system of barbarous spoliation and the imposition upon the natives of forced labor very similar to slavery—a system that is not only unjust but is economically false. On the other hand, Belgian financiers and merchants, who are almost all in favor of Congolese development, believe that the Free State is administered well enough, and accordingly argued that the chambers should leave existing conditions alone. M. Beernaert, under whose ministry the convention of 1890 was concluded, favored immediate annexation, but realizing that Belgium was hardly ready to undertake colonial administration, he proposed that a law be enacted under which for a time the king be empowered to administer the colonial territory. The king, however, opposed immediate annexation and refused positively to administer the Free State except on his own account; that is, under the existing conditions. M. Beernaert thereupon withdrew his proposition. The Belgian ministry finally proposed in June, 1901, to defer annexation but to reserve the right to effect such annexation at such future time as the king might choose, and in order to reserve this right it further proposed that the Congo loan of 25,000,000 francs should continue without interest. This plan, which simply maintains the *status quo*, and which appeared to be fairly acceptable to both the advocates and the opponents of the annexation policy, was adopted by the chambers early in August.

The proposed annexation called forth in the press renewed comments on the alleged despotic rule of the Congo administration. The Manchester *Guardian* declared that the administration had violated almost all the provisions of the Berlin agreement by which the Free State was erected. The journal stated that although private slavery had been abolished, the administration had practically enslaved large numbers of the population, intimidating them by the "armed savages who constitute the Congo State militia and police;" and, it continued, "the Congo State, founded on a basis of free trade and philanthropy, has become a great commercial monopoly, utterly regardless of justice or humanity in its pursuit of gain. Uncontrolled by public opinion, it has permitted or connived at some of the worst excesses recorded in the history of European rule in Africa.

The Bahr-el-Ghazal.—According to an agreement signed in May, 1894, the boundary between the Free State and the British territories in the upper Nile valley was fixed, and Great Britain leased to the Free State, during the reign of King Leopold, the region extending south from the 10th parallel to Albert Nyanza, and known as Bahr-el-Ghazal and the Lado *enclave*. In August of the same year the boundary between the Free State and French territory was defined. In deference to a protest of the French government, King Leopold waived the rights granted by Great Britain except in the Lado district. This action, the Congo authorities maintained, did not invalidate the lease contracted with Great Britain, while Lord Salisbury, the British foreign minister, held the opposite opinion. In May, 1901, negotiations between Great Britain and the Free State took place, looking toward the reestablishment of the latter's rights in the Bahr-el-Ghazal. On July 25 the Brussels *Soir* announced that a settlement had been reached, whereby the rights in question were granted to the Free State during the reign of King Leopold.

Other Events.—Several native outbreaks occurred during 1901. In the spring there were uprisings at Liboko and Diobir, and in June it was reported that the Budjas had defeated the Congo troops in the district of Welle, killing 250 native soldiers. In June, also, it was announced that the tribe of Batatelas, who revolted against Baron Dhanis in 1895, had been definitely subdued, but in the following month news came that they continued to give trouble, and that 1,000 rebels were at large. The Congo authorities made elaborate preparations for the repression of the Batatelas, and in November it was announced that Major Malfeyt had killed three chiefs and taken 600 prisoners. Revolts also occurred in the Mongolla district and in the region of the Kassai, but in September were making no headway. An important military post was established at N'Dobo. In 1901 there was a movement in Cuba among the descendants of Congolese negroes, who, it is said, number about 18,000, for a return to the African fatherland.

CONGREGATIONALISTS passed through, in 1901, an eventful year of their history. At the sixty-ninth annual meeting of the Sunday-school and Publication Society in April, it was reported that the *Congregationalist* had been transferred to that society—an occurrence of note, since there seemed at one time a danger that the paper, which began publication in 1849 and has since acquired a large circulation, would pass from denominational hands. The Congregational Home Missionary Society, to which a large proportion of Congregational churches owe their existence, held its seventy-fifth annual meeting in Boston, May 14-16, when the friction over the administration of the finances, due to the National Society and its State auxiliaries operating in the same field, was harmoniously adjusted by an agreement that the *status quo* be maintained for the ensuing year and that the matter be referred to a committee of fifteen, satisfactory to both elements. This committee met subsequently and decided upon a plan, to be recommended at the next annual meeting, which provides substantially for a federation of the State societies with formal representation in the National. The Home Missionary Society, which has nearly 1,900 branches, distributed as far north as the Arctic Circle, and including four in Cuba, though a large proportion are in the West, greatly reduced its debt in 1901 and reports total receipts of \$538,986. Dr. N. D. Hillis succeeds General O. O. Howard as president of the organization. The triennial session of the Congregational National Council was held in Portland, Me., October 12-17, 1901. This council is composed of delegates from local organizations, and though the supreme body of the church, is purely a deliberative assembly in that its function is advisory only. A memorial to Congress on the subject of a constitutional amendment against polygamy, the commendation of the Anti-Saloon League, a caution to ministers in relation to the marriage of divorced persons, and a radical change in the Ministerial Relief Society, providing for centralization of management in administering trust funds, were features of the meeting, but the most important event was the report of the committee on the federation of Congregational missionary societies. This recommends (1) "the constitution of the missionary societies' membership in a limited governing body, chosen proportionately from the different States; (2) that the various missionary societies have each one administrative head; (3) that all missionary publications be united in one, combining home and foreign work; (4) that the missionary societies hold annually two meetings, one foreign and one union home meeting, alternately in the East and West." The next meeting of the council will be held in 1904, in Des Moines, Ia. Officers: moderator, Rev. Amory H. Bradford, D.D., Montclair, N. J.; secretary, Rev. Asher Anderson, D.D., Auburndale, Mass.; treasurer, Rev. S. B. Forbes, Hartford, Conn.; registrar, Rev. Joel S. Ives, Hartford, Conn. The following statistics, which include Cuba and Hawaii, give a summary of the general status of the church in the year 1901: churches, 5,724; members, 639,957; Sunday-school members, 749,216; members of young people's societies of Christian Endeavor, 187,953; contributions for benevolences, \$2,212,536; expenditures, \$7,512,686—for the United States only; churches, 5,650, gain (in the triennium ending 1901), 36; members, 633,349, gain, 7,485; Sunday-school members, 671,743, loss, 13,961; members of young people's societies, 186,448, loss, 32,103; benevolent contributions, \$6,214,570, loss, \$547,260; home expenses, \$21,246,465, increase, \$1,023,906. In the Sunday-school membership should be included also 69,673 in independent Sunday-schools.

Other occurrences of interest during 1901 were the resignation of Professor George H. Gilbert from the chair of New Testament interpretation in the Chicago Theological Seminary, and the dismissal from the ministry and membership in the church of Professor George D. Herron by a council of the church in Grinnell, Ia. Professor Gilbert, whose case has attracted attention for a year or more, after a year's leave of absence, was unable to change his views respecting the Lord's pre-existence, which were unsatisfactory to the board of directors, and was allowed to resign without reflections on his orthodoxy, his place being temporarily filled by Professor Shailer Matthews, of Chicago University. Professor Herron, formerly professor of applied Christianity in Iowa College, was found guilty of "immoral and un-Christian conduct," the action being based on his divorce and conduct previous to his remarriage, which was solemnized with an entirely novel ceremony that occasioned much comment in the press. Mr. Herron offered to the council a defense of his divorce, in extenuation setting up alleged faults in the marriage system.

CONGREGATIONAL METHODIST CHURCH. THE reports a year of activity, particularly along the line of church building, more churches having been built in 1901 than in any previous year. The denomination, which includes both white and colored, its negro constituents, over 300 in number, being separately organized into conferences, had in 1901 a membership of 21,000, with 345 ministers and 350 churches, a notable increase over the preceding year. The Quadrennial General Conference of the church convened at Rose Hill, Miss., in November, 1901, when provision was made to increase the publishing facilities and, within a few months, to establish a missionary in India. In 1902 the church will celebrate its semi-

centennial, as the first half century since its organization, in Monroe County, Ga., closes on May 8. *The Watchman*, published at Milmer, Ga., Rev. Rolfe Hunt, D.D., editor and publisher, is the general organ of the church.

CONGRESSIONAL LIBRARY, established at Washington in 1800; destroyed in 1814 by the British, and refounded by the purchase of the library of Thomas Jefferson. The last report of Dr. Herbert Putnam, librarian of Congress, is for the year ending June 30, 1901, representing the fourth year in the present quarters. During the year the appropriations and expenditures of the library amounted to \$563,257. The total accessions for the year were 76,481 volumes, 19,000 manuscript pieces, besides a great number of maps and charts, prints, and pieces of music. An increase in the appropriation enables the library to make progress in completion of many fragmentary sets and in the acquisition of standard material in many departments of learning. In this way, more than 26,000 volumes were purchased during the year, while 7,933 were acquired by copyright, and 6,476 acquired by international exchange. Gifts were received from more than two thousand different sources, and an effort is now being made to complete the files of the publications of the various State governments, which receive all federal documents and are under no obligation to make returns. One of the most important features of the accessions has been that of the manuscripts. Among these were the Robert Morris papers, relating to the finances of the Revolution, consisting of 6,000 letters, less than 300 of which have ever been printed. There were also the account books of the Carroll family covering the first half of the eighteenth century, manuscripts relating to the Spanish occupation of Florida, the Columbus codex, consisting of a copy of the various hereditary grants, charters, and privileges made to Columbus, this copy being made by the public notary under the personal direction of Columbus. There are only two other copies in existence, and these are of priceless value. An extensive series of manuscripts relating to the Franco-Prussian War and the Commune of 1871 were added, as also were the Porter papers written by Commodore Porter, covering the period from 1805 to 1812. An important part of the work of the library at present is in the card cataloguing of the contents of the entire library, which now contains more than a million printed volumes. More than 100,000 titles were added to the catalogue list during the year. In this connection the Congressional Library is doing a work of great public service in that it proposes to distribute copies of these catalogue cards to other libraries, thus enabling them to secure the benefit of expert work in cataloguing and printing cards at a fraction of the cost of doing the work independently; and second, in order to place in certain centres of research as complete a statement as possible of the contents of the international collections at Washington. Another important phase of the work of the library during the year was the publications. These included (1) *A Union List of Periodicals, Transactions, and Allied Publications currently received in the Principal Libraries of the District of Columbia*, 315 pages; (2) *A Check List of American Newspapers in the Library of Congress*, 293 pages; (3) *A List of Maps of America in the Library of Congress, preceded by a List of Works relating to Cartography*, 1,137 pages; (4) *A Calendar of Washington Manuscripts in the Library of Congress*, 315 pages; (5) *A List of Books Relating to the Theory of Colonization, Government of Dependencies, etc.*, 156 pages; (6) *A List of Books with Reference to Periodicals on Mercantile Marine Subsidies*, 18 pages; (7) *A List of Books with Reference to Periodicals on the Spanish West Indies*, 18 pages; (8) *A List of Books with Reference to Periodicals on Porto Rico*, 55 pages. During the year the total number of visitors to the library building was 832,370, a daily average of 7,211. A relatively small proportion of these, however, are recorded as readers, although there were issued in the main reading-room more than 400,000 books during the year. The question of Sunday opening for the library is still unsettled, and the librarian makes a strong plea that it be opened, at least after 2 P.M.

CONNECTICUT, one of the New England States of the United States, has an area of 4,990 square miles. The capital is Hartford. The population in 1900 was 908,355, while in June, 1901, as estimated by the government actuary, it was 927,000. The populations of the larger cities in 1900 were: New Haven, 108,027; Hartford, 79,850; Bridgeport, 70,996; and Waterbury, 45,859.

Industries.—The maintenance of Connecticut's preeminence as a manufacturing State was fully shown by the results of the census of 1900. Since 1850 the population of the State has increased from 370,792 to 537,628, or 145 per cent. During the same period the average number of industrial employees has increased 248.3 per cent., from 50,731 to 176,694, and comprised in 1900 19.5 per cent. of the total population. In the latter year there was invested in the 9,128 manufacturing establishments reporting, an actual capital of \$314,696,736, exclusive of capital stock; the gross value of the manufactured products for the year was \$352,824,106, and the net value, exclusive of products re-used in the processes of manufacture, \$208,014,581. The position which Connecticut holds in manufacturing, notwithstanding that it is forty-third among the States in size and twenty-ninth in population, is due, according to the

census report, "in part to its excellent communication by rail and water with all parts of the country; to its geographical location, by which it can handle a large export trade; to its water power; to its plentiful supplies of labor and capital, the former gathered easily in the great centres of the East, and the latter coming to it not alone from its profitable manufactures but also from its large insurance and banking interests; to its joint-stock laws; and, above all, to its early settlers and their descendants, men of great inventive genius, frugality, and industry." In 1890 Connecticut stood tenth among the States in the value of her manufactured articles; from 1890 to 1900 the population increased 21.7 per cent., and the value of the products 42.1 per cent., or at a rate double that of the increase in population. The value of some of the most important of Connecticut's manufactured products for 1900 is as follows, the value of the same product for 1890 being given in parenthesis: ammunition, \$9,823,712 (\$3,838,774); brass manufactures—total, \$48,526,868 (\$22,309,894); brass and copper, rolled, \$29,787,282 (\$4,169,938); brass castings and brass finishing, \$9,470,427 (\$7,428,011); brassware, \$9,269,159 (\$10,711,945); foundry and machine-shop products, \$18,991,079 (\$13,314,156); hardware, \$16,301,198 (\$11,995,023); plated and britannia ware, \$9,538,397 (\$7,569,920); textiles—total, \$49,265,752 (\$46,757,780); cotton goods, \$15,500,842 (\$15,409,476); silk and silk goods, \$12,378,981 (\$9,788,951); woolen goods, \$8,097,218 (\$9,082,493). Connecticut more than any other State is noted for "notions" and specialties, especially those worked in metals. The number of these is very great and of the widest variety, from mouse-traps and necktie fasteners to watches and clothes-dryers. The relative importance of the manufacturing cities has not changed since 1890, New Haven still leading, and being followed by Bridgeport, Waterbury, Hartford, Meriden, and New Britain respectively. Between them, these six cities, the only ones having a population of over 20,000 inhabitants, produced, in 1900, 44.5 per cent. of the total value of articles manufactured in the State, as against 41.3 per cent. in 1890. As showing still further the extent of the concentration of manufactures in Connecticut, it may be stated that sixty-one towns and cities, containing 82.6 per cent. of the population, produce 92.4 per cent. of the value of industrial articles. And this tendency appears to be still increasing.

Constitutional Revision.—On June 13, 1901, the Connecticut legislature passed a bill to submit to the electors in October the question of calling a convention to revise the State constitution. This act was the result of an agitation conducted for some years for the abolition of the existing system of representation in the popular assembly. This system, which is a relic of the time when Connecticut was made up of a few small towns, provides in effect that the basis of representation in Connecticut shall be by townships instead of population. Senators are chosen by popular vote, but assemblymen are chosen by towns, each town, however small, being entitled to at least one. With the growth of Connecticut cities, this system has resulted, as stated by Governor George P. McLean, in enabling less than 20 per cent. of the people of Connecticut to elect a clear majority of both branches of the general assembly, and so secure absolute control of the State government; for some towns having a population of less than 500 retain two representatives, while others with ten times that number are entitled to but one. To remedy this condition, moderate amendments to the constitution were proposed by the Republican leaders, giving every small town one representative, every town of more than 2,500 inhabitants two representatives, and allowing towns one additional representative for every 20,000 inhabitants. But this amendment, although indorsed by the Republican State Committee, was voted down by the country members. In his annual message, Governor McLean had especially advised the legislature against calling a convention for the general revision of the constitution, stating that such action was more radical than the conditions warranted, and that, since all the important provisions of the constitution had already been judicially construed by the courts, "any change in the text, however slight, might entail much hardship, uncertainty, and expensive litigation." When, however, an amendment to the constitution as regards representation was found to be impossible of passage, an agreement was made to call a constitutional convention, provided, however, that this convention should be composed of one delegate from each town, large or small, and that the convention should not be allowed to deny the right to any town to have at least one representative in the House. Although these stipulations give the control of the convention wholly to the rural members, yet their effect is in some degree modified by the fact that the constitution when formulated must be submitted for ratification, not to a vote by townships, but to the voters of the State as a whole.

Corporation Law.—A widely discussed act passed by the Connecticut legislature provided in effect that corporations might be formed in the State by the payment of a small tax, and be thereafter practically free from any State supervisory power. This law was stated to have been passed to induce corporations doing business outside of Connecticut to incorporate in that State; thereby turning a neat sum yearly into the State treasury, and without in any way prejudicing existing industries in the State. The law provided that upon payment of 50 cents for each \$1,000 of capital

up to \$5,000,000, and of 10 cents additional for each \$1,000 of capital over \$5,000,000, corporations might obtain charters forever afterward exempt from State taxation. The annual meetings of the corporation were not required to be held in Connecticut, nor was any one in Connecticut required to hold stock in the corporation, and the corporation was expected only to keep in the State a nominal office and agent. In brief, as was pointed out, "the cheapest charter that could be bought anywhere in the world would be issued strictly upon an advance payment," and the corporation thus equipped could proceed without hindrance to establish its business in all other States of the Union except that of its origination. With the consent of stockholders representing two-thirds of the stock, any such corporation might change its name, the nature of its business, or might increase or reduce its capital stock. Two or more similar corporations carrying on the same or a similar business might consolidate. The stock, when fully paid for, was to be absolutely non-assessable. Probably, however, the most distinctive clause of the act was that which provided that while such corporations might not carry on any railroad business within the boundaries of Connecticut, or conduct any business whatsoever in Connecticut requiring the condemnation of property or the obtaining of franchise rights; these restrictions were not to hold, provided that the business was conducted outside the limits of the State. In commenting upon this act, financial journals pointed out that it was already too much the fashion for one State to pass laws permitting the incorporation of companies intending to do business in another State. For laws thus passed rarely imposed proper restrictions upon the corporations, and, moreover, if the State in which the corporations did business endeavored to restrict or govern them, the corporation could always respond by claiming that they were not subject to the law of the State in which they did business, but only to the interstate commerce law and to the federal courts. In this way, the several States became unable to control the character of large corporations doing extensive business within their boundaries.

Labor Laws.—An interesting law for the benefit and protection of unemployed labor was passed by the Connecticut legislature. This provided for the organization and establishment by the commissioner of the Bureau of Labor Statistics of free employment bureaus in the cities of New Haven, Bridgeport, Norwich, and Waterbury, and provided also that hereafter no private employment bureaus, except for the employment of school teachers, should be opened in the State without being licensed by the commissioner. Bureaus so licensed should be required to file a bond with the commissioner, and should keep registers open for the inspection of the commissioner. They were prohibited from receiving any registration fee greater than \$2.00, and if they did not obtain employment for the applicant or the applicant did not accept the employment offered within a month from the time of application, then the fee should be returned to the applicant on demand. Moreover, a receipt for the fee was required to be given to the applicant, and on the back of the receipt was to be printed the law requiring the return of the money to the applicant under the conditions noted above. A labor law for the protection of Italian contract laborers provided, first, that no contractor or foreman should receive any fee from laborers for furnishing employment to them; second, that shanties, lodging houses, etc., used as places of abode by such laborers should be examined by the health officers, to whom power was given to see that they were kept in a sanitary condition; and, third, that agents who sold goods to laborers and who charged them more than a current market rate for the same should be fined. An act for the licensing of barbers similar to that passed in several other States, but more stringent in its regulations, provided that hereafter no license should be issued to applicants until they had served three years as a barber's apprentice or in a barber's school and had passed an examination showing them among other things to be free from contagious diseases, and possessed of sufficient knowledge concerning the common diseases of the face and skin to avoid the aggravation and spreading thereof. Certificates issued by the licensing board might be revoked for cause.

Other Laws.—The sentence for kidnapping was made imprisonment for not more than thirty years. Another act provided that whenever a temporary injunction had been granted by any judge, other than a judge of the Supreme Court, the Superior Court might in term time, or any judge of the Superior Court, might in vacation, dissolve such temporary injunction. The appointment of a tax commissioner was provided for, who should have power to examine witnesses, compel the production of papers, and should examine in each town to ascertain whether the tax had been properly collected and report thereon to the legislature. The Commissioners of Fisheries and Game were empowered to establish State game preserves by leasing tracts of land under the condition, however, that these tracts might be used by their owners for all purposes except that of game hunting. An act endeavoring to avert accidents from motor vehicles provided that these machines should not run faster than fifteen miles an hour outside any city, nor more than twelve miles within. They should be required, moreover, to reduce speed at intersecting streets or on meeting

wagons; towns, however, might grant permits allowing the motor vehicles to go at a greater speed. An act to institute indeterminate sentences provided that persons who should be sentenced to prison, except for capital crimes, should be sentenced first for the maximum punishment under the law, and, second, for a minimum period in the discretion of the judge, not less than one year; persons, however, who had already been twice sentenced should on the third sentence be given a maximum term of thirty years, and where persons were sentenced for two or more offenses, the first sentence only should be given a minimum term, and the total maximum term should be the combined maximum sentences for the several offenses. The warden and the majority of the board of directors of the State prison were authorized to issue paroles to prisoners who had served their minimum term, and these paroles might thereafter be revoked or made permanent.

Elections.—At the election held on October 7, 1901, to determine whether the constitution should be revised or not, the townships voted almost solidly against the proposition, and it was only through the equally solid affirmative vote of the city that the proposal was carried. Delegates to the convention were chosen at the regular elections in November, and the convention was ordered to meet January 1, 1902. While no general State officers were chosen at the November elections, much interest was shown in the election of municipal officers; notably by the election, as mayor of Bridgeport, of Dennis Mulvihill, a stoker by trade, who had interested himself in politics, and who defeated his Republican opponent by a large majority. Mr. Mulvihill's sole platform was that of an economical and honest administration of the business affairs of his city, and he stated that as he himself had always been poor, he would appreciate the value of every dollar of the taxpayers' money.

State Officers.—Governor, George P. McLean, Republican, elected for two years, term expires in January, 1903; lieutenant-governor, Edwin O. Keeler; secretary of state, Charles G. R. Vinal; auditors, Walter A. Riley and James P. Bree; treasurer, Henry H. Gallup; comptroller, Abiram Chamberlain; attorney-general, Charles Phelps; adjutant-general, G. M. Cole; insurance commissioner, Edwin L. Scofield. Chief justice, David Torrence, Rep., term eight years, expires October, 1909; associate justices, S. O. Prentice, Rep., Frederic B. Hall, Rep., Simeon E. Baldwin, Dem., and William Hammersley, Dem.

Congressional Representatives (57th Congress). In the House—E. Stevens Henry, from Rockville; Nehemiah D. Sperry, from New Haven; Charles A. Russell, from Killingly; and Ebenezer J. Hill, from Norwalk—all Republicans. In the Senate—Orville H. Platt, from Meriden, and Joseph R. Hawley, from Hartford—both Republicans.

CONSUMPTION. See TUBERCULOSIS and CHARITY ORGANIZATIONS (paragraph Consumption).

CONWAY, Sir WILLIAM MARTIN, English explorer and author, was made Slade professor of fine arts at Cambridge University in 1901. He was born at Rochester in 1856, and was educated at Repton, and at Trinity College, Cambridge, where, under the influence of the well-known university librarian, Henry Bradshaw, he became interested in the early history of printing and wood-engraving. At Mr. Bradshaw's suggestion he visited the important libraries of Europe, collecting material for his book on the *History of the Wood-Cutters of the Netherlands* (1884). In the same year he was appointed professor of art at University College, Liverpool, where he remained until 1888. His first expedition was to Egypt, Syria, Greece, Turkey, and Asia Minor, in 1889; in 1892 he went to the Himalayas, where he succeeded in climbing a peak 23,000 feet in height; in 1894 he explored the Alps; in 1896-97 he penetrated into the interior of Spitzbergen; and in 1898 he led a party into the Bolivian Andes, where he ascended Mt. Aconcagua (23,080 feet) and two other peaks of lesser altitude. The results of his numerous expeditions have been embodied in a number of volumes of the greatest interest and value to the scientific world. The titles include: a series of *Climbers' Guide-Books to the Pennine and Lepontine Alps* (1890); *Climbing and Exploration in the Karakoram-Himalayas* (1894); *The Alps from End to End* (1895); *With Ski and Sledge over Arctic Glaciers* (1898); and *The Bolivian Andes* (1901). Important also are his books on art and art history, of which may be mentioned *The Artistic Development of Reynolds and Gainsborough* (1896); *Early Flemish Artists* (1887); *The Literary Remains of Albrecht Dürer* (1889); and *The Dawn of Art in the Ancient World* (1891). He is a fellow of the Society of Antiquaries and of the Geographical Society, and he has been chairman of the Society of Authors (1895, 1898, 1899). See BOLIVIA.

COOK, JOSEPH, American lecturer, died at Ticonderoga, N. Y., June 24, 1901. He was born there January 26, 1838, was educated at Yale and Harvard universities, at the Andover, N. H., Theological Seminary, and in Germany. Although an ordained clergyman, he devoted his energy chiefly to lecturing. In 1875 he instituted the series of "Boston Monday Lectures," that continued, with few interruptions, until his death. In 1880-82 he made a lecturing tour of the world, and in 1895 lectured

in Australia. Mr. Cook, whose lectures were concerned chiefly with the relations of science and religion, published at various times eleven volumes of the Monday lectures, and also a volume on *Current Religious Perils*. In 1888 he established *Our Day*, a magazine devoted to a number of religious and social reforms.

COOPER UNION, FOR THE ADVANCEMENT OF SCIENCE AND ART, New York City, founded by Peter Cooper, and chartered in 1857. The forty-second annual report, submitted June 5, 1901, records that owing to expenditures in remodeling the building, \$107,000 were expended. Owing to the increase of students, much space that had formerly been rented, could be turned into accommodations for the pupils, thus cutting down one of the chief sources of income. The trustees report that an additional endowment of \$300,000 is needed to balance the annual receipts and expenditures. During the past two years, the joint gifts from Mr. Andrew Carnegie and the Cooper heirs amounted to \$1,200,000. In addition to these gifts, a bequest of \$20,000 was received from the estate of Oswald Ottendorfer, and Mr. J. Pierpont Morgan contributed three of the most valuable collections of textile fabrics to be found in Europe, thus making this collection equal to any in the world. During the year ending May, 1901, between 500,000 and 600,000 persons frequented the reading-rooms. The arrangements made for the use of the Great Hall for free lectures for the people was continued during the past year, two nights under the control of the Board of Education, one night in cooperation with Columbia University, and two nights in cooperation with the People's Institute. The idea of free lectures, now so universally prevalent, originated in Cooper Union more than forty years ago, and its growth has been amazing. The officers are: president, Edward Cooper; secretary, Abram S. Hewitt; treasurer, Edward R. Hewitt. A vacancy in the board of trustees was filled by the appointment of Mr. Andrew Carnegie. An admirable account of Cooper Union was published in February, 1901, in *The Iron Age*, and in *The New Yorker Staats Zeitung*.

COOPERATION. The rapid growth of the trust principle in business organization in recent years has given a marked stimulus to the development of cooperation in its various forms. Most practical of these appears to be cooperative buying and cooperative selling. Retail dealers are showing an increasing readiness to unite their purchases, thus in many cases eliminating the jobber and securing carload rates. The farmers are everywhere adopting the same idea, organizing associations modeled on the fruit-growers' associations of California, in order to control the marketing of their own product. This development has been particularly noticeable in the lines of market gardening and dairy farming. The movement has also spread to the grain districts where the basal idea of the Grange has been recently revived. During 1901, upwards of fifty Farmers' Cooperative Grain Associations were organized in Kansas to control their own elevators and buy grain direct from the farmers, thus making them independent of the middleman. In one instance the association paid five cents more for wheat than the regular dealers. Cooperative telephone and insurance companies are also multiplying. Cooperation among final consumers has made little progress as yet, but indications point to rapid development in this field. Of peculiar interest in this connection are the various cooperative commonwealths in existence in the United States, which seek to unite producers and consumers in one organization whose earnings are divided among the members on some basis fixed by agreement. The July (1901) *Bulletin* of the Department of Labor contained an elaborate investigation by Rev. Alexander Kent of the present status of cooperative communities in the United States. He divides them into (1) communistic, (2) socialistic, and (3) partially cooperative. The existing societies are the Shakers, who now number seventeen societies in nine States, the Amana Society, in Iowa; the Harmony Society, near Pittsburg, Pa.; the Ruskin Commonwealth, founded in Tennessee in 1894, and subsequently transplanted to Duke, Ga.; the Cooperative Brotherhood at Burley, Wash.; the Brotherhood of the Cooperative Commonwealth, organized in 1895, and also located in Washington; the Industrial Brotherhood at Thomaston, Me.; the Colorado Cooperative Company in Montrose County, Col.; the Straight-Edge People, with headquarters at 240 Sixth Avenue, New York; the Cooperative Association of America, organized at Lewiston, Me., in 1900; the National Production Company, with headquarters in Florida, since become a part of the Cooperative Association of America; the Cooperative Industrial College near Camp Creek, Ga.; the Commonwealth of Israel, in Dallas County, Mo.; the Altruist Community, of St. Louis, Mo.; the Association of Altruists, at Moorestown, N. J., founded in 1900; the Lord's Farm, at Woodcliffe, N. J.; the Mutual Home Association, at Carr's Inlet, Puget Sound, found in 1896; the Mutual Aid Cooperative Association, with headquarters at 864½ Howard Street, San Francisco; Freedom Colony, in Bourbon County, Kan.; the Willard Cooperative Colony, organized in 1895, in Cherokee County, N. C. Most of these societies have been organized from philanthropic or religious motives, and are not distinguished for practical business sense. Mr. Kent concludes with reference to these Utopian communities that so long as some ideal,

whether theocratic or social, continues to dominate their policies, so as to subordinate the instincts of individual self-seeking, while they remain isolated from the outside world, they can achieve a fair measure of success. The continued growth of the Anama Society, which was founded in 1861, is an illustration of successful cooperation. Its members speak only German, and have little contact with their neighbors. Under ordinary circumstances, however, when brought into close contact with the outside world these communistic communities are generally short lived. A number are mentioned as having dispersed. It is worthy of remark, however, that some of these enterprises which have been started within the last five years are organized on a business basis. They do not attempt to realize impossible ideals, but to secure for their members the profits of production and distribution. These give fair promise of success. Most conspicuous is the Cooperative Association of America, a corporation organized under the laws of Maine. This company was organized by Bradford Peck, a successful business man of Lewiston, Me., who had already introduced the cooperative idea into the Bradford Peck Company Department Store in Lewiston. The capital stock is \$10,000, on which, however, no dividends will ever be paid because all earnings go to co-workers. The purpose of association is ultimately to form within itself a federation of all legitimate branches of business. The association was started in the spring of 1901, and already controls the largest grocery and general market business in Lewiston and Auburn. It also conducts a large restaurant. Both buildings are the property of the association, which expects to absorb several of the large business interests of the city. The association has planned to purchase several large farms near Lewiston from which to supply its own stores and its co-workers with everything that can be produced from the farm. The grocery store and market have over 600 pledged customers who trade with it regularly. Each one has invested \$25.00 in the business with the understanding that he is to make his purchases at the store and to receive every six months as a rebate most of the net profits. The organization aims to pay each one of its co-workers exactly what his labor creates, either directly in wages or by a reservation for investment in building and machinery.

In this connection it is of interest to note the continued progress of the cooperative idea in Europe. The cooperative movement in Belgium in 1900 numbered 251 societies. During 1898-1900 the new cooperative societies founded were as follows:

Savings and loan societies.....	116
Creameries	210
Consumption	124
Purchase and sale.....	67
Breweries and distilleries.....	65
Production	48
Insurance	31
Miscellaneous	45

On January 1, 1900, there were in Belgium more than 1,800 cooperative societies, with an estimated membership of 200,000. The "Rockdale" is the system of co-operation there employed. It consists in selling at a profit and then distributing the profit at the end of the half year or year.

In a recent number of the *Economic Review*, the present condition of the cooperative movement in Great Britain was discussed. There are three types of co-partnership in existence: (1) Cooperation for manufacturing production; (2) for consumption by means of federated leagues of consumers; and (3) agricultural co-operation. The first preponderates in England, the second in Scotland, and the third in Ireland. From 1893 to 1899 in England there was an increase of nearly 37 per cent. in the number of societies and over 100 per cent. in the amount of bonus paid to employees as a dividend on their wages. The growth in trade, capital and profits is equally remarkable. Capitalization of the workers profits up to a certain amount is required. A provident fund of 10 per cent. of net profits is generally maintained. In Scotland the development of cooperation is almost wholly in the two great federations of consumers' societies, the Scottish Wholesale Society, and the United Banking Society of Glasgow. In Ireland, the membership of the co-partnership societies is about 60,000, most of the members being small peasant farmers. But few of these have as yet become shareholders. The development of cooperation in Great Britain has resulted in better wages, shorter hours, and more regular work than under competitive conditions and in addition, in many places 6 per cent. on their wages as dividends. There is a tendency on the part of the British productive societies to seek the open market and to depend less upon the custom of the cooperative stores.

COPPER. The production of copper in the United States in 1900 amounted to 606,117,166 pounds valued at \$98,494,039, as against 568,666,921 pounds, valued at

\$101,222,712 in 1899. Of the former product, Montana produced 39.6 per cent., Michigan 25.9, and Arizona 23.4, the remainder coming from about 14 other States. The exports of fine copper in 1900 amounted to 160,082 long tons, as against 119,811 long tons in 1899, while the total value of the imports, which were mostly manufactured articles, amounted to \$10,318,944 in 1900, as compared with \$10,128,862 in 1899. The production of 1901 will probably show a slight decrease, this being specially due to Montana, where some of the larger mines were inactive on account of litigation or repairs. There was also a falling off in the production of Arizona, but the Lake Superior region on the other hand witnessed an increase. Some copper was mined during 1901 in Vermont, and there was also a reopening of the New Jersey copper mines. In the foreign countries the Chilean mines show a greatly increased output and it is very likely that a much larger production is to be looked for from Mexico in the near future. A. N. Winchell notes an interesting occurrence of the formation of certain copper minerals in smelters in which he finds that both bornite and chalcopyrite are formed artificially at the smelter of the Butte and Boston Consolidated Mining Company at Butte, Mont. These substances were formed in the Allen O'Harra Calcining furnace along the rails in its bed, so that at the end of six months or a year very little iron was left in the rail and it had to be replaced by a new one. Both minerals have evidently been formed, he considers, by sublimation and not by fusion, for the temperature of the furnace is never high enough to melt the ores in it.

The following table from the United States Geological Survey gives the production of copper for 1900:

Source.	1900.	Maine, New Hampshire, Vermont, Tennessee, Southern States, and Middle States	
Lake Superior	145,461,408	Lead desilverizers, etc.	4,820,495 3,000,000
Arizona	118,317,764		
Montana	270,738,489		
New Mexico	4,169,400		
California	28,511,225		
Utah	18,354,726	Total domestic copper...	606,117,166
Colorado, including copper smelters (a)	7,826,949	From imported pyrites and ores and matte (b)	36,380,000
Wyoming	4,203,776		
Nevada	407,535	Total (including copper from imported pyrites).	642,497,166
Idaho	290,162		
South Dakota	15,147		

(a) Copper smelters in Colorado, purchasing argentiferous copper ores and mattes in the open market, source not known. The quantity of Montana matte which goes to one of these works has been deducted.

(b) Estimated.

COQUELIN, BENOÎT CONSTANT, the French actor, who, with Mme. Sarah Bernhardt (*q.v.*), toured the United States in 1901, was born at Boulogne-sur-Mer, January 23, 1841. He is the son of a baker and intended to follow that trade; but, showing a great fondness for the stage and a remarkable aptitude for acting, he went to Paris to enter the Conservatoire in 1859. Here he was one of the most brilliant of M. Regnier's students, winning a second prize in comedy, and he made his début at the Théâtre Français in 1860 as Gros-René in the *Dépit Amoureux*. M. Coquelin remained at the Français continuously until 1886, winning success in many diverse rôles, and in the latter year became a pensioner of the theatre. In 1889 he re-entered the Français, playing some of his former parts in support of his son. In 1891 he created the part of Labussière in Sardou's *Thermidor*, which was soon interdited by the government, and the next year he played Petruccio in a modified version of *The Taming of the Shrew*. At the Théâtre Porte Saint Martin in 1898 M. Coquelin brought out, with immediate success, Rostand's *Cyrano de Bergerac*, in which the combination of braggart, poet, and swordsman in the title rôle, gave full rein to his power. He has published, *L'Art et le Comédien* (1880); *Molière et le Misanthrope* (1881); *Un Poète du Foyer*, Eugène Manuel (1881); *Un Poète-philosophe*, Sully-Prudhomme (1882); *Les Comédiens par un Comédien* (1882); *L'Arnolphe de Molière* (1882); and *Tartuffe* (1884). M. Coquelin first visited the United States in 1889, and after his retirement from the Français in 1886 he undertook half-yearly tours in Europe and England, playing the rest of the time in Paris.

COREA, a constitutional monarchy of eastern Asia, occupying the peninsula between the Sea of Japan and the Yellow Sea. The capital is Seoul.

Area and Population.—The 13 provinces comprising Corea have an estimated area of 82,000 square miles and an estimated population of about 10,500,000. The foreign inhabitants number upwards of 20,000, of whom over four-fifths are Japanese.

Seoul has about 201,000 inhabitants, Ping-Yang 40,000, and Chemulpo 12,000. The prevailing language is intermediate between Japanese and Mongolo-Tartar. Aside from the worship of ancestors, religion has small place in the lives of the people.

Government and Finance.—The existing constitution was promulgated in August, 1899. The present monarch, Si Hi (or Yi Heui), who succeeded to the throne in 1864 and assumed the title of emperor on October 15, 1897, rules with the aid of a cabinet which has both executive and legislative power. Corruption has characterized the administration, but after the treaty of Shimonoseki in May, 1895, reforms were introduced through Japanese influence; there persists, however, a strong reactionary tendency. The independence of the Korean government is not regarded as a thing of permanence, since the country seems to be destined sooner or later to fall under the formal authority of either Russia or Japan. The most important item of revenue is the land tax. The estimated revenue and expenditure for 1899 were 6,473,222 yen and 6,471,132 yen respectively. The yen is worth 49.8 cents.

Industries and Commerce.—Agriculture, though in primitive condition, is the principal industry and rice the leading product. The country's mineral resources, however, give much promise and gold for some time has been an important export. Besides rice, the important crops include leans, ginseng, wheat, barley, millet, and oats. In view of the possible scarcity of food, the government forbade the exportation of rice, the prohibition taking effect on August 23, 1901. As rice is the chief article of export, it was thought that the foreign trade would suffer during the ensuing year. Formerly about 60 per cent. of the imports were British and about 30 per cent. Chinese and Japanese; but of late Japanese trade has been increasing. Besides importing large amounts of cotton goods, the Japanese control the entire ginseng crop, which is one of the principal Korean exports. They have nine-tenths of the shipping and virtually monopolize the Ping-Yang coal fields. The total trade of Corea, foreign and coast, was reported to amount in 1898 to 24,702,237 yen; in 1899, 22,074,669 yen; in 1900, 27,490,388 yen. In the last named year the net imports were valued at 13,355,272 yen (\$6,650,926), and the net exports, 9,439,867 yen (\$4,701,054). The last figure includes a declared export of gold valued at 3,633,050 yen (\$1,809,239). The actual gold export, however, appears to exceed this, the amount stated for 1900 being 4,101,260 yen (\$2,043,427); in 1899, 3,184,653 yen (\$1,585,957); in 1898, 2,391,452 yen (\$1,190,943). The net imports for 1900 were classified as follows: Cotton goods, 5,497,970 yen; foreign sundries, 4,958,746 yen; native sundries, 2,414,813 yen; metals, 421,581 yen; woollen goods, 54,228 yen; miscellaneous piece goods, 7,933 yen. Among the sundries the following were leading items: American kerosene, 1,797,630 yen; Japanese kerosene, 222,730 yen (other kinds amounted to only 18,748 yen, making the total kerosene import 2,039,108 yen); matches, 481,354 yen; mining supplies, 317,686 yen; bags, etc., for packing, 284,902 yen; railway supplies, 182,806 yen; provisions, 132,047 yen. The chief exports in 1900, besides the gold mentioned above, were: Rice, 1,145,805 yen; beans, 946,358 yen; fish, 60,533 yen; ginseng, 60,310; wheat, 55,876 yen; and hides, 22,890 yen. The actual value of American imports, except kerosene, is not accurately known, since foreign goods reach Corea chiefly through Japan and Shanghai, but for 1900 their estimated value was about 2,373,000 yen (\$1,182,000).

Communications.—The only railway in Corea is between Seoul and the port of Chemulpo, 26 miles; it was constructed by an American, but is now owned and operated by a Japanese syndicate. At Seoul is an electric tramway (10 miles), built and operated by Americans. A concession to build a railway from Seoul to Fusan, on the southeastern coast, was granted to a Japanese syndicate in September, 1898. The projected line was backed by an interest guaranty by the Japanese government. In the fall of 1901 the Japanese syndicate was amalgamated with a Belgian company. The survey for the railway was being made in the summer of 1901, and on August 20, construction was begun at Yong-Gong-Po, across the river from Seoul. It was expected that the road would be completed in six years. The road will be standard gauge, 287 miles long, and the estimated cost of construction is 25,000,000 yen. The total length of bridges on the line will be 20,500 feet, and the tunnels, 31 in number, will aggregate 40,700 feet. There seems to be some doubt as to whether the road will be a paying investment, but in any event it will strengthen Japanese influence in Corea. In 1901 a French company contracted with the government to build a railway from Seoul to Wi-ju, about 350 miles distant on the northern frontier, and during the summer the route was under survey. The construction of this road will be very difficult, since the country is mountainous and many rivers, as well as much quicksand, it is said, must be crossed. (See paragraphs on History.) The Korean foreign post-office has been in operation since January, 1900. There is telegraphic communication between Fusan and Seoul, and the latter city and Chemulpo, whence a cable extends to Nagasaki, Japan. There are also telegraph lines between Seoul and Wi-ju, connecting there with the Chinese system, and between Seoul and Wonsan (Yuen-san).

HISTORY.

Quelpart.—About the last of May, 1901, a rebellion broke out in the island of Quelpart, lying off the southern coast of Corea. The disturbances, though in part directed against the government, were essentially of an anti-Christian character. The government, it appears, increased the taxes and appointed a number of native Catholic Christians as collectors, whereupon the outbreaks took place. It seems that attacks were made by both Christian and non-Christian natives and several hundred people were killed. At the appearance of French war vessels in June the disturbances came to an end. Considerable blame for the troubles is attributed to the French Catholics in Quelpart.

The Customs Commissioner.—In March, 1901, the government dismissed the commissioner of customs and controller of finance, Mr. John McLeavy Brown, a British subject. Russian influence was suspected, but the Russian authorities asserted that the dismissal was in no way due to their influence. In April, upon the protest of the British minister, the order of dismissal was withdrawn; the question was revived, however, in May, when Mr. Brown again was ordered to relinquish his control of the customs, but about the first of July he was "restored to the capricious favor of the weakling emperor."

The Northern Railway.—Some apprehension of unwarranted Russian influence was felt in April, 1901, when it was announced that the Korean government had decided to contract with a French syndicate a $5\frac{1}{2}$ per cent. loan of 5,000,000 yen (\$2,490,000) for the purpose of beginning the construction of the projected railway from Seoul to Wi-ju, 350 miles distant. Interest was to be guaranteed by a lien on Korean mines. The terms of the agreement, however, were preliminary and in some quarters were considered impracticable. It was even stated that the Koreans did not wish to build the railway, but preferred to use the loan for gold and silver coinage and for the exploitation of the coal fields of Ping-Yang. Japan maintained that the loan would violate the convention of 1896, "whereby Russia and Japan agreed that, should Corea require a foreign loan, both would lend assistance by common accord." M. Pavloff, the Russian minister to Corea, stated that he did not look upon the loan with favor, since so small a sum was liable to be dissipated in bribes and official overreaching. He added that, in order "to accomplish anything," Corea "must borrow largely."

Russia and Ching-Kai.—In the spring of 1901 it was reported that Russia was attempting to acquire Ching-Kai (also written Chin-hai and Shin-hai), a bay in the extreme south of the peninsula midway between Vladivostok and Port Arthur.

It will be remembered that in 1900 Japan entered strenuous protests against Russia's proposal to acquire for a naval station a harbor about 20 miles from the treaty port Masampho, which is separated from Japan by the Corea strait. Russia did not secure the coveted station, but was forced to be content with a coaling station for the Russian Steamship Company within the bounds of the foreign settlement of Masampho. In the spring of 1901 the Japanese press indicated that a similar protest would be made by the government against any expression of Russia's desire to acquire Ching-Kai. The "lease" of Ching-Kai as a naval station would materially strengthen Russian sea power in the Far East, and accordingly would be prejudicial to the peace of Japan. It appeared also that Great Britain had reason to object to Russia's acquisition of the bay; since the former power, when Corea was still regarded as being under the suzerainty of China, gave up possession of Port Hamilton—only 75 miles distant from Ching-Kai—in virtue of a Russo-Chinese agreement that Russia should not seek to acquire territory in Corea. Later it transpired that, while Great Britain looked upon the agreement as permanent, the signatory powers admitted a private stipulation that it should stand for only ten years. And Russia, moreover, pointed out that Great Britain was not a party to the agreement.

Japan at Chapokpo.—In November, 1901, it was announced that the Korean government had allotted to Japan 650 acres at Chapokpo, near Masampho, for a special settlement policed by Japan. Russia was formerly anxious to secure this land, which had been surveyed by a Russian warship. This concession, within the treaty-port limits, balanced the concession at Masampho already made to Russia (1900).

Russia and Japan.—Corea is regarded as an object of almost certain contention between Russia and Japan. The latter country needs it as an outlet for her congested population; Japan, indeed, believes the possession of Corea to be essential to her economic and political success. Russia, on the other hand, determined to retain that for which she has so long striven—an outlet in the Liao-tung peninsula—would regard, and probably with justice, the Japanese possession of Corea as a serious menace to her interests. The feeling is general that Russia will be successful, though at present Japan is stronger on the sea and, according to a Japanese authority, can at short notice send into Corea military forces superior to Russia's. This, of course, is doubtful. But the influence of the Japanese seems to be gaining strength. They are not only maintaining their position in Corea, but are increasing in number

throughout the peninsula. They watch every movement of Russia, while that government recognizing the Japanese power, "acts with studied conciliation, ostentatiously communicating to the Japanese legation the movements of Russian troops in Manchuria, especially if they be on the Korean frontier."

CORN.—The corn crop was the crop disaster of the year 1901. It was the nearest approach to a corn failure the country has ever known. The United States Department of Agriculture has given out no fixed figures for the total crop, but the statistician in his preliminary estimates places it at nearly or quite 700,000,000 bushels below the average; and the *American Agriculturist's* preliminary estimate is 1,500,000,000 bushels, in comparison with 2,105,102,516 bushels in 1900. The spring of 1901 was quite unfavorable for the corn crop, being cold and wet throughout the corn belt, delaying plowing and planting, and making germination slow and uneven. A month or six weeks of cold weather followed in most sections, checking the growth and stunting the plant. As a consequence, the crop was backward and the stand inferior, when the hot weather and drought of the latter part of June and July caught it. The continued hot winds and lack of rain lasted until the close of July, and when the drought ceased the damage was permanent over a great range of the corn belt. The period of high temperature and hot winds was coincident with the appearance of the tassel, and prevented the formation of ears, though the stalks revived and grew after rain came. This caused the earlier estimates to be too high. The rain saved the corn that was planted late, for that remained at a standstill during the drought; and the month of September was generally quite favorable to finishing the crop. A considerable acreage in Illinois, Iowa, Missouri, Kansas, and Nebraska was either abandoned, cut for feeding, or pastured.

The preliminary estimates of the United States Department of Agriculture, issued in November, for the average yield per acre by States, which are the only data issued by the department, together with the estimate of the *American Agriculturist* for the acreage planted in corn and the yield by States, are as follows:

STATES.	AVERAGE YIELD PER ACRE.		Average Quality.	Estimated Acreage. (Am. Agri- culturist.)	Yield by States. (Am. Agri- culturist.)
	1901.	For 10 Years.			
	Bush.	Bush.	Per cent.		Bush.
Maine.....	39.4	36.5	98		
New Hampshire.....	38.5	37.1	99		
Vermont.....	40.0	38.4	99		
Massachusetts.....	40.5	38.0	96		
Rhode Island.....	32.1	31.6	97		
Connecticut.....	39.0	34.9	98		
New York.....	33.0	31.9	92	494,000	15,314,000
New Jersey.....	36.9	32.8	91		
Pennsylvania.....	35.0	31.5	90	1,288,000	41,216,000
Delaware.....	30.0	22.8	96		
Maryland.....	34.2	27.2	94		
Virginia.....	22.2	18.7	91		
North Carolina.....	12.0	12.8	81		
South Carolina.....	6.9	9.6	72		
Georgia.....	10.0	10.8	86		
Florida.....	9.0	9.7	83		
Alabama.....	10.9	13.0	75		
Mississippi.....	10.9	14.8	71		
Louisiana.....	13.7	16.8	68		
Texas.....	11.6	19.3	62	4,589,000	54,609,000
Arkansas.....	8.1	18.6	51	2,556,000	20,488,000
Tennessee.....	14.2	21.5	69	3,301,000	45,224,000
West Virginia.....	23.0	25.0	80	717,000	13,623,000
Kentucky.....	15.6	26.0	67	3,228,000	51,648,000
Ohio.....	26.1	32.5	79	3,347,000	83,006,000
Michigan.....	34.5	30.3	92	1,258,000	38,998,000
Indiana.....	19.8	31.7	71	4,371,000	96,162,000
Illinois.....	21.4	32.3	71	8,176,000	170,345,000
Wisconsin.....	27.4	31.2	79	1,578,000	41,817,000
Minnesota.....	26.3	29.2	80	1,153,000	28,825,000
Iowa.....	25.0	31.8	80	9,045,000	220,500,000
Missouri.....	10.1	27.4	51	6,564,000	63,567,000
Kansas.....	7.8	21.9	51	7,961,000	45,675,000
Nebraska.....	14.1	25.2	66	8,103,000	117,417,000
South Dakota.....	21.0	21.4	79	1,356,000	26,780,000
North Dakota.....	22.6	23.2	82	22,000	550,000
Montana.....	25.0	23.7a	93		
Wyoming.....	39.5	23.7b	98		
Colorado.....	17.1	19.3	82		
New Mexico.....	31.6	20.6	96		
Utah.....	19.4	22.2	87		
Washington.....	17.5	18.2c	88	11,000	275,000
Oregon.....	20.8	25.4	87	21,000	454,000
California.....	31.0	29.7	94	51,000	1,326,000
Oklahoma.....	7.3		49		

a.—Seven years. b.—Six years. c.—Nine years.

The average yield of corn for the United States is given as 16.4 bushels per acre, as compared with an average yield of 25.3 bushels per acre in 1899 and 1900, and a ten-year average of 24.4 bushels. This is the lowest yield per acre ever recorded for the corn crop. In all of the 23 States having one million acres or over of corn, except Pennsylvania, Virginia, and Michigan, the average yield was below their ten-year averages. The quality averaged only 73.7 per cent., as compared with 85.5 per cent. in 1900 and 87.2 per cent. in 1899. The total area planted, according to the *American Agriculturist*, was 87,050,000 acres, as compared with its estimate of 86,276,000 acres the preceding year; and the total yield estimated by that journal November 16, was 1,418,849,000 bushels. The price of corn per bushel, which is regulated by the production in the United States rather than by the world's crop, has been more than twice what it was in 1896, the last year of the agricultural depression, so that despite the small crop, its total value is estimated at \$720,000,000, or about \$232,000,000 more than the 50 per cent. larger crop of 1896. The price of No. 2 corn during the winter ranged from 56 to 74 cents a bushel.

The Department of Agriculture has published no summary of the world's corn crop for 1900. Ordinarily the United States produces about four-fifths of the total crop of the world, Austria-Hungary ranking second and Mexico third. The Hungarian minister of agriculture estimated the world's crop of 1900 at from 2,778,000,000 to 2,815,000,000 bushels. The returns for 1899 showed 2,735,090,000 bushels, of which 2,078,144,000 bushels were produced in the United States and 110,000,000 bushels in Mexico. The crop in Austria in 1900 was 15,446,134 bushels, from an area of 829,270 acres; in Russia 34,256,460 bushels, and in Italy 86,266,080 bushels. The 1901 crop of the latter country is estimated at 86,068,700 bushels, which is very close to the average for that country, and that of Ontario, Canada, at 24,838,105 imperial bushels of corn on the ear. Reports from Austria in October were to the effect that the corn crop had not in general quite come up to expectations, but was for the most part satisfactory. In Hungary the yield was satisfactory in the greater part of the country, the quality being good and in some places excellent. An effort is being made in Russia to increase the growing of corn and to extend it to the north of its present limits. At present the crop is confined to quite limited districts in southern Russia, the total area in corn in 1900 being only 3,268,473 acres. The Russian government has lately taken the matter up, the Ministry of Finance, in a recent official publication, urging an increase in the cultivation of corn as a means of minimizing the adverse effects of the increased German tariff on cereals, the exports of corn being chiefly to other countries than Germany. The exports of corn from the United States during the fiscal year ended June 30, 1901, as compiled by F. H. Hitchcock, chief of the section of foreign markets, United States Department of Agriculture, together with the figures for the preceding year, are as follows:

EXPORTS OF INDIAN CORN FROM THE UNITED STATES.

Countries to which exported.	Year ended June 30.			
	1900.		1901.	
	Bushels.	Value.	Bushels.	Value.
United Kingdom	85,318,727	\$34,993,528	79,844,843	\$37,282,851
Germany	46,256,978	18,776,736	36,992,634	17,305,229
Netherlands	23,584,536	9,556,637	17,647,894	8,111,664
Denmark	18,863,505	7,509,637	11,189,798	5,049,492
Belgium	9,618,054	3,974,552	10,002,294	4,740,607
Canada	12,043,574	4,584,059	10,642,863	4,560,393
France	5,297,212	2,103,572	4,458,029	1,950,546
Other countries	8,365,638	3,707,679	7,039,610	3,527,201
Total	209,348,284	\$85,206,400	177,817,965	\$82,527,983

In the field of experimentation on this staple crop there has been quite the usual amount of activity. Irrigation experiments on corn in Wisconsin gave remarkably striking results, showing the great benefit of even small amounts of irrigation water. The yield with irrigation was 65 bushels of ear corn per acre, and without, only 30 bushels. The season, however, was very favorable for showing the effect of irrigation. The breeding experiments have given several varieties of promise, especially for the northern corn-growing regions, North Dakota and Minnesota; and by selection with reference to maturity and hardness the corn belt is being pushed farther north year by year. The possibility of increasing the protein content of corn by selection on a purely mechanical basis has been demonstrated, and is now being undertaken on a commercial basis in Illinois by growers of seed corn. A variety or strain richer in protein is extremely desirable, but doubt has been expressed whether this quality could be permanently fixed and transmitted, or whether the selection would not be necessary every year. Recent experiments have confirmed the previous

findings of the practically uniform productiveness of the seed from the middle, butt and tips of the ears. The cost of growing corn in recent years has been carefully estimated by a number of experiment stations. In Arkansas a crop of 30.8 bushels per acre was found to cost $22\frac{1}{4}$ cents per bushel. In Illinois the cost under the average conditions of the State was 19.5 cents per bushel, and in Nebraska the cost on two different fields was at the rate of 14.9 and 23.4 cents per bushel respectively. Probably the most important result of the year relates to silage—or the preservation of the whole corn plant in silos. The changes in composition and the heating which silage undergoes had been supposed to be due to bacterial action; but Babcock and Russell in a recent investigation have shown that bacteria or microorganisms are in no way essential to silage production, and although ordinarily present are undesirable and a source of loss through the decomposition of organic matter which they cause. The initial heating of silage is explained as due mainly to the intramolecular respiration of the cut and bruised tissues of the plant, which also accounts for the evolution of carbonic acid gas. As silage with typical flavor and aroma was made under conditions in which all vital processes are suspended, it is suggested that enzymes are operative in this connection. The work has emphasized the advantages of thoroughly constructed silos, and close packing of the corn, to exclude the air as far as possible and so reduce the losses. Increased value is being attached to the corn stores or stalks from which the ears have been picked, both as a feed and for manufacturing purposes. For several years the pith from these stalks has been used in the arts, principally as a packing in battle ships, and the past year several factories have paid farmers as high as \$3.50 a ton for the stalks. Quite recently practical trials have demonstrated the value of the fibre of the stalks for paper making, and patents have been issued. The shell or shive of the stalk, as well as the pith, is found to be an entirely satisfactory and cheap paper stock. These materials give an unusually tough and pliable product, and appear to be suited to making a great variety of grades. Good board, superior to straw board, can be made at less cost, it is said, than from straw. In view of the bounteous supply of corn stalks, renewed every year, and the present search for suitable paper stock, the discovery seems to be one of much promise; and it seems likely that the despised corn stalk, now largely wasted in many sections, may become a material source of profit, as well as the grain.

CORNELL UNIVERSITY, Ithaca, N. Y., founded 1868, with the Medical College located since 1900 in New York City. The teaching staff for 1900-01 was 324, consisting of 94 professors and 134 instructors and assistants at Ithaca, and 30 professors and 66 instructors and assistants in the Medical College. The student-body, including 237 medical students in New York City, numbered 2,080, of whom 205 were in the graduate department, 755 in the undergraduate college of arts and sciences, and the remainder in the three professional and six technical schools. This also includes the 424 students attending the summer session. This is an increase of more than 200 over the attendance for the previous year. During the year, 11,500 volumes and 2,000 pamphlets were added to the library, which now numbers upwards of 250,000 volumes and 40,000 pamphlets. The life of the University during the year was marked by no events of especial importance. In order to exercise an efficient control over the rapidly increasing body of students, all authority in matters of discipline was centred in the general university faculty, instead of being divided as hitherto to the several special faculties. The president recommends that the university faculty delegate this authority to a committee on student conduct, which shall consist of the dean and secretary of the university faculty, the deans and secretaries of the four largest special faculties, to be joined in every case by the dean and secretary of the special faculty to which the offending student belongs. During the year there was a general demand on the part of the students, which was seconded by the members of the faculty, for an abandonment of the honor system of examination and a return to the old proctor system. During the year considerable discussion was aroused throughout the State concerning the policy of the College of Forestry, in whose charge had been given a large section of the Adirondack forests. The policy of the school had been to cause a removal of the old forest in about fifteen or twenty years, meanwhile replacing it by a new growth of better composition and promise partly through natural regeneration and partly by artificial reforestation. However, the curtailment of the funds received from the legislative grant from the \$50,000 recommended to \$30,000, necessitated the concentration of logging operations so that some 500 acres were denuded while only about 75 acres were planted during the year. More ample funds and time, it is hoped, will remove the cause of public criticism from this Cornell school which, during the past year, sent out the first graduates in forestry in America. During the year two new buildings were begun: Stimson Hall, for the medical department at Ithaca, and the central dome-crowned portion of Sibley College. While the productive funds of the University amount to about \$7,000,000, and the total property at almost \$11,000,000, yet with an annual increase of 200 students the president indicates a great need for

funds and for at least ten new buildings. To meet this need, Mr. John D. Rockefeller has agreed to give \$250,000 on condition of subscriptions of an equal amount by the 1902 commencement. The University authorities are now engaged in what promises to be a successful effort to meet these requirements. See **PSYCHOLOGY, EXPERIMENTAL**.

CORNU, MAXIME, French agriculturist, died April 5, 1901. He was born July 16, 1843, at Orleans, and was educated at the Ecole Normale Supérieure, where he specialized in the study of botany. After serving as assistant to Duchartre at the Sorbonne, he became attached to the staff of the Museum of Natural History under Brogniart, paying particular attention to mycology and plant pathology. He discovered the *Phylloxera vastatrix*, a disease which in 1868 was devastating many French vineyards, and served as secretary of a government commission appointed to investigate the subject. He was soon recognized as the leading authority in this specialty, and his opinions were sought from many countries of the world. In 1884 he was appointed professor of culture at the Museum and there devoted himself to agricultural experiments and researches, with particular reference to the industrial needs of the French colonies.

CORPORATIONS. See **FINANCIAL REVIEW, STRIKES, TRUSTS, and UNITED STATES STEEL CORPORATION.**

COSTA RICA, a Central American republic and the most southern country of the North American continent. The capital is San José.

Area, Population, etc.—The area of the five provinces and two territories comprising Costa Rica has been estimated at 23,000 square miles. The settlement of the boundary dispute with Colombia through the arbitration of the president of the French republic, September 12, 1900, was not satisfactory to Costa Rica. Although the southern part of the new boundary met with little criticism, President Yglesias, in his congressional message, May 1, 1901, spoke of the decision as one that had "blasted the hopes of the government and shocked in like manner the whole country." The estimated population in 1899 was 310,000. Roman Catholicism is the state religion. Public primary education is free and, unlike that in most of the Latin-American countries, actually compulsory.

Government.—The chief executive is a president, who is elected for a term of four years, and is assisted by a cabinet; the president in 1901 was Rafael Yglesias, who was reelected in November, 1897. The legislative power devolves upon the chamber of representatives. The regular army and navy are inconsiderable.

Finance.—The monetary standard is gold and the unit of value (since July 15, 1900) is the colon, worth 46.5 cents in United States money. Customs and excise constitute the chief sources of revenue. The revenue and expenditure in pesos (the average value of which was about 3 cents less than that of the present colon) were 8,413,198 and 8,069,748 respectively for the fiscal year 1899, and 8,225,142 and 7,444,970 for 1900. For the fiscal year 1901 the revenue was reported at 8,700,833 colones. The foreign debt, amortization of which will begin in 1917, amounted to £2,085,000 (\$10,150,652) in 1900. The internal debt in 1899 was 2,922,221 pesos.

Industries, Commerce, etc.—The cultivation of coffee and bananas is the leading industry and stock-raising is important. The total imports and exports for the fiscal year 1899 (in gold pesos valued approximately at one dollar in United States money) were 4,136,707 and 4,929,955 respectively; for 1900, imports 6,084,898, and exports 6,321,196. Included in the imports of the latter year was coined gold to the value of 977,105 pesos. The percentages of the imports of merchandise by countries for 1899 and 1900 respectively are: The United States, 54 and 46.20; Great Britain, 19.60 and 27.30; Germany, 14.55 and 13.59; France, 5.90 and 5.94. The leading imports are cotton and other textiles and iron and steel ware. The chief export is coffee, bananas ranking next; the export of cabinet and dye woods and hides and skins is important. The coffee export increased from 23,129,000 pounds in 1894 to 43,153,000 pounds in 1898, and fell in 1899 to 33,807,000 pounds; this was valued at \$2,866,000, of which 55 per cent. represented exports to Great Britain, 26 per cent. to the United States, and 15 per cent. to Germany. The coffee exported in the fiscal year 1900 amounted to 35,756,218 pounds (16,218,954 kilogrammes) valued at \$3,800,188. The banana export has grown from 3,500 bunches in 1881 to 3,420,166 bunches, valued at \$1,354,386 in the fiscal year 1900. Financial and economic conditions in Costa Rica were unfavorable in 1901, owing largely to the depreciation of coffee. This situation, however, was regarded as temporary; Costa Rican coffee, which is unexcelled by that of any other American country, is gaining favor in the United States. On September 1, 1901, a law abolishing the export duty on coffee became operative. According to a government decree import duties were increased 50 per cent. on April 28, 1901. There are somewhat over 150 miles of railway open to traffic and railway construction is in progress.

COTTON. The cotton industry in the United States during the year 1901 was marked by continued prosperity, which has extended from the producer to the

manufacturer, though in certain branches of the textile trade conditions were not so good as might be desired. Discussing first the production of cotton, it is necessary to consider previous crops in order to realize the conditions at the beginning of the year. Census Bulletin No. 98 of the Twelfth Census (September 28, 1901), gives statistics for the cotton crop in the United States for 1900. The production in bales (of 500 pounds) is given as follows: Alabama, 1,061,678; Arkansas, 828,820; Florida, 55,696; Georgia, 1,270,597; Indian Territory, 288,114; Kansas, 151; Kentucky, 133; Louisiana, 714,073; Mississippi, 1,055,968; Missouri, 27,980; North Carolina, 509,341; Oklahoma, 116,875; South Carolina, 780,782; Tennessee, 227,601; Texas, 3,536,506; Virginia, 11,833. Thus the crop in 1900 amounted to 10,486,148 bales, as compared with 9,450,000 bales in 1899, and the record crop of 11,270,000 bales raised in 1898. In 1899 there was a short crop not only in America but in Egypt and India, so that when the American crop of 1900 was marketed it brought the highest price that cotton had touched for ten years (12.75 cents January 28, 1901, at New York). With the profits of an excellent season to encourage them, the southern planters early in 1901 made preparations for an active season. With abundant capital, resulting from the successful marketing of the crop of the previous year, extensive purchases of fertilizers were made, and a largely increased acreage was planted. Everywhere possible cotton was planted, and a total of 27,532,000 acres under cultivation was reported to the government—an increase of some 2,000,000, or about 8 per cent. over the acreage of 1900, and about 3,000,000 acres over the usual average acreage. Under such conditions it was evident that the high prices of the early part of the year could not be maintained, and the price steadily fell, until May 13, when middling upland cotton sold at New York for 8 1-16 cents. Soon, however, various weather and other conditions began to make themselves felt, and the late spring and heavy rains of the early summer gave a new aspect to the situation, and put the price higher. On account of these facts and the droughts of August and September in Texas, the average condition of the crop, which was stated at 82 per cent. of perfect on June 1, fell successively month by month, until on October 1 it was announced as 61.4 per cent., or, with a single exception, the lowest on record in over thirty years, the lowest year referred to being 1896, when but 7,100,000 bales were produced. Successive estimates put lower figures on the production, which was variously given at from 11,200,000 to 10,250,000 bales. On December 3, considerable excitement was produced when the Department of Agriculture submitted its final estimate of 9,674,000 bales, but the estimate was considered too low by many authorities, who added from half a million to a million bales to these figures. The tendency naturally was to put the price up, so that at the close of 1901 cotton sold in New York for 8 7-16 cents, as compared with 7 13-16 cents on November 6. India, Egypt, and central Russia were said to have good crops at the close of the year, but as the larger part of the world's production comes from the United States the interest centres in the crops of the South.

The consumption of cotton, however, is not so largely confined to the United States as is its production. Of the 12,141,000 bales, which represented the world's production for the season 1900-01, on September 1, 1901, there remained a visible supply of 1,569,000 bales, while in the hands of the spinners there was an invisible supply of 1,042,000 bales. Of the total production Great Britain took 3,368,000 bales and Continental Europe 4,576,000, while in the United States the spinners used 3,727,000 bales. Of this last amount, 2,150,000 bales were consumed by northern spinners, and 1,557,000 by southern factories. When it is recalled that in 1890 the southern mills consumed only about 613,000 bales, as compared with about 2,000,000 taken by northern mills, the growth of the home consumption and industrial progress in the South is apparent. It may also be added that with the low price of labor in the South, these mills are making substantial profits, and that a considerable amount of the coarser cottons once made by the northern spinners is now woven in the South.

On September 1, 1901, the number of spindles in the world was estimated at 108,069,835, of which number 20,869,835 were credited to the United States, 46,400,000 to Great Britain, 33,000,000 to Continental Europe, 6,700,000 to the East Indies, Japan, and China, 640,000 to Canada, and 460,000 to Mexico. Throughout the world there has been a substantial yearly increase in the number of spindles, as is shown by the following comparative figures: 1897, 99,093,526; 1898, 100,884,679; 1899, 103,675,847; 1900, 105,130,515; 1901, 108,069,835. Considering the increase in spindles in the United States alone, the following figures are of interest and again emphasize the increasing ability of the southern mills to take care of a product peculiarly their own. The figures cover the past three years ending August 31, 1901:

Spindles.	1900-01.	1899-1900.	1898-99.
North	15,050,000	14,590,000	13,950,000
South	5,819,835	4,540,515	3,987,735
	<hr/> 20,869,835	<hr/> 19,130,515	<hr/> 17,937,735

This statement shows that the season of 1900-01 witnessed the greatest increase on record of spindles in southern mills. The mills themselves have also increased in number, but not so rapidly as in the previous year. The large gain in spindles is due to the equipment of the mills then under construction. Among the new mills in the South there are a number devoted to fine yarn goods, an industry that is increasing in prominence.

In distinction to the year 1900, the year 1901 was generally satisfactory to the manufacturers and dealers in cotton goods. The chief reason was that the markets of China, closed on account of the Boxer uprising, were again thrown open, and there have been large exports for this trade. The decline in the exports to China, caused by the outbreak, is shown in the following statement of exports for the past three fiscal years ending June 30:

	1900-1901.		1899-1900.		1898-1899.	
	Yards.	Value.	Yards.	Value.	Yards.	Value.
Colored goods.....	115,949,219	\$ 6,534,225	87,880,515	\$ 4,839,491	108,940,972	\$ 5,221,278
Uncolored goods.....	135,564,132	7,851,812	264,314,474	13,229,443	303,063,083	13,748,619
Total cotton manufactures exported.....	251,503,351	\$14,386,037	352,194,989	\$18,068,934	412,004,055	\$18,969,897

During the year 1901, however, conditions changed and there were large shipments to China, which normally takes about one-half of the exports of cotton goods sent out from the United States. At the close of the year figures were available for the ten months ending October 31 and are given below in a series of tables, while for purposes of comparison figures for similar periods in 1900 are given. The total exports in these ten months were:

	Yards.	
	1901.	1900.
Colored Goods.....	109,805,798	71,618,468
Uncolored Goods.....	203,665,190	158,165,215
Totals	313,470,988	229,783,683

The interesting question is, to what countries are these exports shipped? This is indicated in the two following tables, the first showing the countries where the exports for ten months in 1901 increased over those in 1900, while the second table shows those countries where there has been a decrease:

	Yards.	
	1901.	1900.
China	167,507,871	100,968,632
Africa	6,204,175	3,727,723
United Kingdom.....	7,875,643	4,878,403
Santo Domingo	4,154,890	2,763,758
Cuba	3,984,194	2,430,077
Colombia	19,508,778	3,599,263
Oceanica	28,500,328	18,757,252

	Yards.	
	1901.	1900.
Central America	10,215,946	12,016,305
Mexico	3,229,823	4,298,643
Sundry West Indies.....	14,730,253	18,071,015
Sundry South America.....	21,177,177	26,239,504
British East Indies.....	5,884,674	10,017,286

As regards the domestic trade in cotton goods, the year 1901 was considered generally satisfactory. Printed calicoes do not enjoy the sale that they once did, and there was less demand in 1901 than previously. Other printed fabrics, however, have met with good sales, and there have been substantial profits to the manufacturers. The mills in Fall River, Mass., where there are usually various labor troubles or other vicissitudes to be recorded, did not enjoy as successful a year as in 1900, since for a part of the time print cloths sold for less than the cost of manufacture. An average dividend of 5.37 per cent. on a capital stock of \$21,301,000 was paid—a rate which is more than 2 per cent. less than that of the previous year, and about .75 per cent. less than the average for thirteen years.

COTTON, General FREDERICK CONYERS, English military engineer, died in London, October 12, 1901. He was born in England in 1807, and entered the army, in the Madras engineers, at an early age. After serving for some time in the Public Works Department he was employed in the first China War as assistant, and later as commanding engineer. It was for distinguished services in this war that he was brevetted major-general. For several years he was associated with his brother, Sir Arthur Cotton, on the India irrigation works on the Godavari. He retired from active service in 1860.

CREIGHTON, Rt. Rev. MANDELL, Anglican bishop of London, died in London, January 14, 1901. He was born at Carlisle, Northumberland, July 5, 1843, and was educated at Durham Grammar School and Merton College, Oxford, graduating with the highest honors in 1886. At graduation he was elected a fellow of his college and remained at Oxford as tutor until 1875. During this time he took the orders of deacon, 1870, and priest, 1873, and in 1875 assumed a vicarage, the college living at Embleton in his native shire. This he left in 1884 to reenter academic life as occupant of the Dixie chair of ecclesiastical history established at Emmanuel College, Cambridge, in that year. In 1891 he became Bishop of Peterborough and continued there until translated to the see of London in 1897, in which year he became, ex-officio, a privy councillor. Dr Creighton represented Emmanuel College at the 250th anniversary of the founding of Harvard University in 1886, and the Church of England at the coronation of Czar Nicholas II. in 1896. As bishop of London he had to confront many delicate questions relating to the form of the church service, the disposition of which was a distinctive commentary on his discretion and impartiality, in view of his widely known sympathy with High Church principles. As an historian, Bishop Creighton ranked high. His chief works are *History of the Papacy* (5 vols., 1882-94), an authority on the subject; *Age of Elizabeth* (1876); and *Cardinal Wolsey* (1888). He was also the founder and first editor (1886-91) of the *English Historical Review*.

CREMATION OF THE DEAD. In January, 1901, the first municipally owned crematory in Great Britain was opened at Hull, England. The crematory is described as a brick building comprising a hall or chapel 24 feet square, a second room containing the incinerating chamber, and a tower 70 feet high. The cremating apparatus is a furnace of the regenerative type, designed by the late Henry Simon, president of the Manchester Crematorium Society. It consists of three interior chambers, the two lower of which are surrounded by air passages. The lower chamber contains a coke fire, and the upper one is that in which the cremation takes place. The fire is lighted some hours before the apparatus is used, and is supplied with air in the usual way. By the time the apparatus is ready for use the walls of the air passages are thoroughly heated. Most of the direct air supply is then cut off, and the partially consumed gas (carbonic oxide) from the coke is allowed to mix in the second chamber with the air heated by passing through the side air-passages. The incinerating chamber is thus filled with gas of an intensely oxidizing character in a state of incandescence. The degree of heat can be regulated in the most exact manner. There is no smoke and little visible flame before the body is introduced, and if the coffin is made in accordance with the regulations, there is no smoke and no noise during the cremation. The process occupies about one hour, at the end of which, there remain only the inorganic bases of the bones, in the form of silvery gray, pumice-like fragments. These remains are placed in an urn. The interior of the cremating chamber is at no time visible to the mourners. When the committal sentence in the religious service is read, the coffin passes noiselessly by means of invisible mechanical arrangements, through curtains, into an intermediate chamber, and the curtain falls behind the coffin as it enters the cremating chamber. The charge for cremating the bodies of residents within the city is £1 1s., or a little over \$5; for non-residents, it is £3 3s. The mayor, in his address at the opening of the crematory, spoke of the urgent need of the general adoption of this method of disposal. He said that when one realized that at least 500,000 people died in one year in the United Kingdom, they would at once see how the disposal of the dead might be a serious menace to the health of those who live in the large cities and towns. Several other English cities have obtained authority from Parliament to construct crematories.

The first legal recognition of cremation in the Dominion of Canada was obtained by its advocates in 1901, when a bill was passed, after a close vote, by the Quebec legislature, granting powers to the authorities of the Mount Royal Cemetery to construct and operate a crematory. Determined opposition was made by the Roman Catholic members of the legislature, and after their defeat the Archbishop of Montreal issued a pastoral letter, in which he condemned cremation strongly, and stated that it is prohibited for all adherents of the Church.

In the United States, during 1901, one additional crematory was completed—that at Portland, Ore. There are now twenty-six crematories in the United States and one

at Montreal, Canada. All are owned and operated by private corporations. A cremation congress was called to meet at Buffalo during the Pan-American Exposition, but was adjourned on account of the assassination of President McKinley. During the autumn of 1901 a book entitled *A Quarter Century of Cremation in North America*, written by John Storer Cobb, the honorary president of the New England Cremation Society, was published for that organization. The book gives a history of the movement in America, and also contains a brief account of its advance in Europe. Statistical tables with summaries show the number of cremations that have been made in each crematory in both America and Europe. A very full bibliography is also included. The table relating to the United States is given herewith. The total number of cremations in Europe, at the close of 1900, were: Italy, 4,110; Denmark, 146; France, 2,245; Germany, 4,261; Great Britain, 2,482; Sweden, 721; Switzerland, 719; grand total, 14,684.

	1870 to '83	'84	'85	'86	'87	'88	'89	'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	1900	Total
Baltimore, Md.....							3	5	12	16	22	15	11	17	21	14	22	18	176
Boston, Mass.....			1	8	17	16	23	30	38	27	30	31	41	28	44	40	43	67	484
Buffalo, N. Y.....											1	87	88	135	160	167	230	188	1,066
Chicago, Ill.....																		80	80
Cambridge, Mass.....											6	42	66	54	82	130	127	188	696
Cincinnati, O.....					11	21	34	45	43	34	42	38	66	46	71	59	56	81	647
Davenport, Ia.....									6	7	13	8	8	9	23	17	18	24	133
Detroit, Mich.....					3	10	14	24	21	33	47	22	31	29	44	51	33	56	418
Fort Wayne, Ind.....															5	1	3	4	13
Lancaster, Pa.....			3	36	14	13	6	1	3	1	3	5	2	1	1	2	5	2	99
Los Angeles, Cal.....						7	5	12	17	29	41	37	38	37	37	34	58	52	456
Milwaukee, Wis.....														21	34	30	53	40	178
New York, N. Y.....			9	77	67	83	106	160	187	186	232	243	296	330	331	466	528	602	8,908
Pasadena, Cal.....													4	14	13	24	31	26	112
Pittsburg, Pa.....						14	28	31	51	62	68	74	88	85	78	114	108	119	918
San Francisco, Cal.....											42	111	167	171	265	322	454	645	2,167
St. Louis, Mo.....						24	20	42	60	64	72	87	96	86	118	109	128	149	1,084
St. Paul, Minn.....															2	11	27	16	56
Swinburne I., N. Y.....							4	3		61	22	3	1	1	3	2	7	4	111
Troy, N. Y.....								4	10	14	15	12	10	8	14	13	20	16	146
Washington, D. C.....															25	38	28	25	116
Washington, Pa.....			25	13	1	1												1	41
Waterville, N. Y.....											1	1	4	5	6	4	6	10	37
Totals.....	25	16	47	114	127	190	263	373	471	562	668	824	1,017	1,101	1,390	1,693	1,996	2,414	13,281

CRETE, a Mediterranean island constituting an autonomous state subject to the suzerainty of Turkey. The capital is Canea.

Area, Population, and Industries.—The total area is 3,326 square miles. The census of June 17, 1900, showed the population, exclusive of 6,096 foreigners, to be 301,273, of whom 267,266 were Greek, 33,281 Mohammedan, and 726 Jewish. Compared with the census of 1881, the Greek element showed an increase of 62,256, and the Mohammedan a decrease of 39,955. The Mohammedan population is chiefly in the three towns of Candia, Canea, and Retimo.

Agriculture, though the principal industry, is neglected. The chief product, olive oil, and soap are the leading exports. The total imports and exports in the fiscal year 1899 were valued at 12,351,105 drachmai (19.3 cents) and 6,600,198 drachmai respectively. The commerce is largely with Greece and Turkey.

Government and Finance.—Through the intervention of Great Britain, Russia, France, and Italy in 1898, Crete became an autonomous state under the nominal suzerainty of Turkey. Prince George, second son of the King of the Hellenes, was chosen high commissioner by the powers, and he has held the office since December 21, 1898. The constitution, adopted April 28, 1899, places the executive authority with the high commissioner, who is assisted by a council of five members (four Christian and one Mohammedan). The legislative power devolves upon an elective assembly, in which Mohammedan representation is assured; ten deputies are appointed by the high commissioner. Questions concerning foreign relations are determined by representatives of the four protecting powers at Rome.

Revenue is derived largely from direct taxes, and the principal expenditures are for internal administration. Import duties are forbidden. The estimated revenue and expenditure for the fiscal year ending August 31, 1900, balanced at 5,274,118 drachmai; for the fiscal year 1901, revenue, 6,263,195 drachmai, and expenditure, 6,994,255 drachmai; for the fiscal year 1902, revenue, 4,046,890 drachmai, and expenditure, 4,568,464 drachmai.

History.—The results of the elections to the legislative assembly at the end of

April, 1901, were: Opposition members, 54; government supporters, 6 (of whom, however, 3 were doubtful); Mussulmans, 3; while 10 other deputies were to be designated by Prince George. The assembly convened on May 31 and passed a censure upon the administration for extravagance, inefficiency, and particularly neglect of public works.

During 1901 anti-Mussulman influence in Crete was active for the annexation of the island to Greece. Late in February Prince George was informed that his proposals for such annexation and for the supersession of the international troops by Greek troops had been rejected by the protecting powers—Great Britain, France, Russia, and Italy. He reported his failure to the assembly upon its convening May 31, whereupon that body adopted a resolution requesting the powers "to put a crown on their noble and philanthropic work by granting union with Greece." The resolution was communicated by Prince George to the consuls, who, acting on instructions from their respective governments, returned the document to the Prince; while on June 18 the protecting powers, through the consuls, delivered to Prince George a declaration intimating their determination to maintain the *status quo*. The joint note pointed out that any infringement of the rights of the Sultan might not only arouse the Moslem inhabitants of Crete, but subject Greece again to the hostility of Turkey, while the existing arrangement, insuring simplicity of administration and exemption from heavy taxation, best tended, in the opinion of the powers, to the moral and material improvement of the inhabitants. Moreover, it was feared that annexation would open the "Balkan question," which "every European cabinet, including that of Greece," was "anxious to keep dormant." A conservative and apparently sound opinion, and one that was widely shared by the press, was thus stated in the London *Saturday Review*: "A change in the relations of Turkey to the Balkan states is certain, and circumstances, if not the action of the Sultan, must soon upset the present artificial balance. A feature of the reconstruction will probably be the incorporation of Crete with Greece, but the time is not yet. The Cretans have no immediate grievance, and the only hope for the peace of the future is that the intricacy of this arrangement and relation of the near eastern countries should be simplified slowly as the several difficulties arise."

In July, 1901, it was reported that Prince George and the chamber of deputies were at variance on several questions of administration. The Prince demanded the nomination of mayors by himself, while the deputies insisted that mayors should continue to be elected by popular vote. Through the vote of ten deputies appointed by the Prince, the chamber, by a majority of one, accorded the Prince the right of appointing the mayors. The government stated that the Prince's reason for wanting this power was his wish to obviate dissensions incident to local elections.

The high commissioner and the deputies were also at odds with regard to the press. The Prince held that in addition to his right to suppress publication, he had the right to press censorship; this position was opposed by the deputies, who kept well in mind the arbitrary measures taken against the liberty of the press by the Prince's secretary, M. Papadiamantopoulos. It was stated that the Prince would respond to a strong feeling in Crete if he would break from Greek influence and appoint an adviser from some disinterested nation, such as Switzerland, Holland, Belgium, or the United States.

Representatives of the four protecting powers decided on November 19, 1901, that Cretans sentenced in Turkey for political or common-law offenses should be transferred to Crete, and that the Cretan flag and Cretan passports should be recognized by the Ottoman government. See *ARCHÆOLOGY* (paragraph Crete).

CRETINISM. A congenital or infantile form of myxœdema, though loosely used to include cases of that disease beginning at eight to twelve years of age. In some cases of myxœdema, the functional activity of the thyroid gland is diminished by disease, and in others there is a formation of new tissue in the gland, forming a goitre. Cretinism is epidemic in valleys in the mountainous districts of Europe and Asia, and is sporadic in the British Isles, France, South Australia, and America. In the congenital form of the disease, the infant is stunted, the body swollen and sodden, the nose broad, flat and retroussé; the cheeks are baggy; the lips thick, the lower one being everted; the mouth is large, and the tongue, which is thick and broad, generally protrudes. The ears are large, the brow is narrow in front, while the posterior fontanelle remains open and the occiput is broad. The skin is dry and rough; the neck is short and thick. The abdomen is prominent and pendulous, and the spine is arched forward. The legs are short and thick. There is early mental arrest and the patient is an idiot. It was reported in 1901 that in the eastern part of France there were 32 cretins per thousand, and in the whole of France about 125,000 cretins and myxœdematous idiots. In Switzerland and in Austria the number is said to be as great as in France. In North America up to the present time less than 100 cases of sporadic cretinism have been reported. Treatment of the condition consists in graduated doses of thyroid gland.

CRICKET. In 1901 the United States was again visited by a British eleven, under the captaincy of B. J. T. Bosanquet, a player in former international matches here. They played at Philadelphia and New York and in Canada. The Englishmen tied in the games played at Philadelphia and won at New York and in Canada. The twenty-ninth annual match between the United States and Canada, at Toronto, September 9-10, was won by the Americans, for the nineteenth time. The Belmont Cricket Club of Philadelphia made a tour to Nova Scotia in August, and won the majority of the games played there. A Canadian team made an unsuccessful trip to Philadelphia and New York in June. The Halifax Cup, the most noted cricket trophy in America, was played for by the principal clubs of Philadelphia, the stronghold of cricket in this country, and was won by Belmont Cricket Club, with 8 out of 10 games; the other teams stood: Merion, 7 out of 11; Germantown (team B), 6 out of 10; Germantown (A), 5 out of 11; Philadelphia, 1 out of 10. Belmont C. C. also won the Philadelphia Cup. Paterson won the Metropolitan District league championship (New York) and the Knickerbocker Athletic Club won the New York Cricket Association Championship. The annual League Association match was won by the Metropolitan League. The Philadelphians won their annual matches with New York teams. The annual championships of the Intercollegiate Cricket Association, composed of Haverford, Harvard, and the University of Pennsylvania, were won by Pennsylvania. The last named beat Haverford 173-165, and Harvard by default; Haverford beat Harvard 101-99. The Northwestern Cricket Association, organized in 1896, and composed of Chicago, Denver, Omaha, Minnesota, Cincinnati, St. Louis, and Winnipeg teams, held its annual tournament August 19-26, at Chicago, whose team won the championship.

CRIME. The record of criminal statistics in the United States prepared by the Chicago *Tribune* presents the following statistics of murders. The total number of deaths by violence in 1901 was 7,852, as compared with 8,275 in 1900. The causes are classified as follows:

Quarrels	4,646	Resisting arrest	134
Unknown	1,291	Highwaymen killed	70
Liquor	820	Riots	36
Jealousy	284	Self-defense	23
By highwaymen	193	Strikes	20
Insanity	174	Outrage	12
Infanticide	149		

The number of legal executions in 1901 was 118 as compared with 119 in 1900, 131 in 1899, 109 in 1898 and 127 in 1897. "There were 82 hanged in the south and 30 in the north, of whom 71 were negroes and 47 whites. The crimes for which they were executed were: Murder, 107; criminal assault, 9; attempted criminal assault, 1; and train robbery, 1." The total number of lynchings in 1901 was 135, as compared with 115 in 1900, and 107 in 1899. Of these lynchings, 121 occurred in the South and 14 in the North. Of the total number, 107 were negroes, 26 whites, 1 Indian and 1 Chinaman. The alleged crimes were as follows:

Murder	39	Alleged theft	1
Criminal assault	19	Keeping a gambling house	1
Theft	12	Suspected of killing cattle	1
Murderous assault	9	Resisting arrest	1
Attempted criminal assault	8	Insulting white woman	1
Cattle and horse stealing	7	Burglary	1
Complicity in murder	6	Arson	4
Quarrel over profit sharing	5	Suspected murder	3
Suspected criminal assault	1	Forcing a white boy to commit crime	1
Murder and criminal assault	1		
Train wrecking	1		

"Besides these, 9 were lynched because of race prejudice, 3 for unknown causes, and there was 1 case of mistaken identity."

One of the most suggestive discussions on the subject of crime during 1901, was by Mr. Eugene Smith, of New York, on "The Cost of Crime," presented to the International Prison Association. The total cost of crime is divided into (1) the cost of preventing crime, (2) the direct damage from crime. In estimating the amount of expenditure on the national crime account the writer based his figures upon conclusions drawn from the detailed returns from particular cities and towns, assuming that the same conclusions would apply to other cities and towns similarly situated. On this basis he concludes that the total amount of city and county taxes paid by the dwellers in cities averages \$3.50 for each inhabitant, and for the rural

districts \$1.00 per inhabitant. The total cost of crime, the known expenditure for this purpose by State and national governments being included, was then estimated as follows: City and county taxation chargeable to crime—30,000,000 inhabitants of cities at per capita rate of \$3.50, \$105,000,000; town and county taxation chargeable to crime, 45,000,000 inhabitants at \$1.00, \$45,000,000; federal and State taxation chargeable to crime, not less than \$50,000,000; total, \$200,000,000. This sum, approaching though it does the cost of public education is only the cost of preventing crime. There yet remains the assessment of the direct damages of crime. The author computes from various bases of judgment that the average annual profits of the habitual criminals are \$1,600. The number of persons now in confinement in the United States is 100,000, of whom 40 to 50 per cent. may be classed as habitual criminals. But the number of prisoners represents only a fraction of the actual criminals in the United States. The habitual criminal is the one most skilled in escaping detection. "The percentage . . . of habitual criminals among the total number of criminals at large is much greater than their percentage among prisoners, and the author thinks that the total number of habitual criminals at large in the United States is not less than 250,000. On the basis of \$1,600 each, the aggregate annual income of the habitual criminals of the United States is \$400,000,000. This amount, however, represents only the "net profits" of crime to the criminal, and is "not a measure of the actual loss and damage caused by crime. Stolen goods can be converted into cash only at a great discount; the amount of money realized by the thief is but a fraction of the real value of the article stolen. Is it more than one-half or two-thirds? And yet the real value is the measure of the loss." There should be added to this the cost of arson, a crime which usually escapes detection; and the money value of the time, life, and labor lost and the expense incurred as a result of the 7,351 homicides, 8,347 assaults, and 454 cases of malicious mischief and trespass; and also the cost of locks, bars, bolts, safes, vaults, and burglar alarms, appliances which owe their existence to crime. When these supplementary items are added to the \$600,000,000 of computed cost, there results an enormous aggregate, considerably exceeding, on the basis of Mr. Smith's figures, one billion dollars, or more than 12-10 per cent. of the total wealth of the United States.

The Hon. Otis Fuller, general superintendent of the State Reformatory, Ionia, Mich., at the meeting of the wardens' association discussed among other topics the fee system and the subject of prison labor: "I believe the day is not far distant when every person engaged directly or indirectly in the administration of justice will be placed upon a salaried basis, and his financial reward for protecting the rights of the innocent will be as great as his reward for convicting the guilty. Then the shameful spectacle of constables, marshals, and justices of the peace engaged like pawn brokers or peanut vendors in a scramble for business which may involve the sacred liberties of their fellow men will be a thing of the past." The discussion which followed this paper showed that the fee system, while slowly disappearing, is still in vogue in many States. In Ohio, for example, sheriffs receive 50 cents a day for the keep of prisoners, and even when sentenced to the penitentiary they are sometimes held for two or three weeks in order to secure the fees. Mr. Fuller was also vigorous in advocacy of convict labor: "It seems strange that the voters or the tax payers should be fooled with the theory that idleness can be a source of wealth, and that it benefits free labor to be obliged to support itself and idle prisoners in addition. Yet this sort of argument seems very attractive, and each year shows further encroachments upon prison labor. Labor is the first requisite of prison reform. Many go into prison because they have never learned to work; many more because they have never learned to do anything well enough to hold a job. So when a young man leaves prison with a habit of industry fixed by regular hours of labor every day under a watchful instructor who sees that the work is well done, he has made an excellent start toward reform. So labor is absolutely necessary for the prisoner's good, for the public is the financial gainer by the prisoner's reformation. To make this labor otherwise than productive is a wanton waste and a great wrong to the mass of the people who are taxed to support the prisoners."

Mr. Z. R. Brockway, for many years superintendent of the Elmira (N. Y.) Reformatory, contributed to the proceedings of the American Social Science Association an important paper on *The Best Treatment of Criminals Whether Felons or Misdemeanants*, largely based on his own observations. He states that criminals as a class are physically devitalized and degenerate; that 81 5-10 of those which have come under his own observation are undisciplined of mind, and that not one of these had received a college education—that intellectually they are both helpless and wayward; that criminals taken as a class have not been trained for useful work, their industrial defects being not merely a lack of skill, but a lack of application. "The worthless class for industry, as discovered on admission, is say 85 per cent. of all, and more than that proportion . . . is improvident." The total money deposited by 1,500 persons did not exceed \$1,500. Habitual criminals are generally immoral. Of 10,000 criminals examined, 28 8-10 per cent. were without moral sense.

43-1-10 per cent. were below the average "of safe inhabitancy;" 22-6-10 per cent. were normal, and 5-8-10 per cent. were over-sensitive. The conclusion is that too much reliance can be easily placed upon moral and religious means for reforming prisoners who do not readily respond to moral motives. The "culture field" of criminals is the class of misdemeanants. Every year 175,000 persons are arrested for the first time charged with misdemeanors, and out of this class the habitual criminals are recruited. "Shiftless, inadequate measures with the misdemeanants, together with the inadequate damage done by turning out from institutions lads and others institutionized, untrained in industry and in habits of self-support, is the prolific source of crime." Mr. Brockway considers that the prevention of crime must be the work of public institutions, mainly prisons and reformatories, and that serious defects now exist in the prison system: (1) Failure to legislate and treat with reference to the general effect upon the volume of crimes; (2) lack of centralized prison administration which is also necessary to secure adequate statistics; (3) sentimentality in prison management; (4) incompetency in management due to the influence of partisan politics; (5) exaggerated estimate of the importance of productive prison labor; (6) arrogant ostracism of ex-criminals. Aside from the correction of these evils, Mr. Brockway considers the most effective measure of reform to be the adoption of the educational idea in prison discipline. This includes physical culture by gymnasiums, manual training schools, and military training, intellectual culture of every grade; appeals to the æsthetic, moral, and spiritual senses; intelligent direction of the life of the prisoner, with the use of the indeterminate sentence, so that when the prisoner comes to deserve his freedom he may straightway receive it. Mr. Brockway also proposes, in order to teach the prisoner self-rule and appreciation of the fact that the law "... is a legitimate expression of a public life and prospect of which he himself partakes," that a measure of self-government shall be introduced into prisons. On the whole, most confidence is placed in the system of industrial training as a means of reformation. "After all, the chief concern must be to fit the prisoners for self-subsistence, properly earning, spending, saving; to impart the necessary skill of hand and eye, in a particular trade or occupation, ... to give power of application and endurance. ... This seems most reasonable when it is remembered that crime springs from ill-conditioned property relations. The bulk of crimes are against the property rather than the person or the peace. Of the fifteen hundred prisoners under my charge, 94 per cent. were property offenders, and the crimes of others could be traced to property. All admit that adjustment of the prisoner's economic relations promotes rehabilitation, and I affirm such adjustment as the indispensable requisite to safe discharge and afterward to safe habitancy."

At the congress held at Amsterdam, October 1, 1901, the occasion was seized by the Italian school to smooth the way for an understanding with the French school. It was deputed to Enrico Ferri to give a moderate expression to certain extreme views commonly attributed to the Italian school. "By establishing their first principle that certain men are born criminal, they did not mean that such men are condemned by some inexorable fate to the actual commission of crime. The hereditary and organic dispositions with which a man is born may be modified through the persistent influence of the social environment in which he lives, and by the education, physical, mental, and moral, to which he may be subjected. But when the inborn dispositions are left to drift toward violence and cunning, and the primitive bestiality of man revives, when to the lack of education are added want and alcoholism, then crime is as sure to follow as the solution to mathematical equations. The practical conclusion of all the new science is, therefore, that society should provide each of its members with sufficient conditions of human development, should lessen want, and, most of all, should find a remedy for the ever increasing evil of alcoholism. In penal law, educative and preventive measures should take the place of repression; penalties should be graduated, not, as in present penal codes, according to a hypothetical degree of personal culpability, but by a classification based on the degree of social danger presented by the criminal; judicial procedure and organization must be so modified that the physician be an aid to the judge, and the judge himself be a criminologist. The authorized members of the French school received this declaration of principles kindly, giving all to understand that the difference between them and the Italians was one of degree only."

During the year indeterminate sentence laws were passed in New Jersey, New Hampshire, Connecticut, New York, and Kentucky. The Indiana report shows: (1) 85 per cent.—that is, 971 out of 1,141 cases—were satisfactory; (2) habitual criminals are in for longer terms which they do not like, and accordingly hasten to leave Indiana at the first opportunity.

Samuel J. Barrows, commissioner for the United States on the International Prison Commission, has prepared a report on the penal codes of France, Germany, Belgium, and Japan, dealing with the historic aspects and criminal procedure. The report contains an interesting article on Japanese prisons, where advanced methods

exist. The Commission appointed to codify the criminal and penal code of the United States have made their report. The first code (1790) contained 33 sections; this of 1901, 461 sections. The report is confined to the classification, definition, and punishments of crimes. According to the recommendation of the National Prison Congress, the last Sunday in October is designated as Prison Sunday. The object is to educate the community in the causes and aspects of crime, and to impress the public with a realization of responsibility for the conditions and administration of prisons and reformatories. The annual report of the city magistrates of New York compares the conditions of crime in 1800 with 1900. Twenty-six new crimes have been added. Complaints of masters against apprentices and crimes incident to slavery have been done away with.

CRISPI, FRANCESCO, Italian statesman, died at Naples, August 11, 1901. He was born at Ribera, Sicily, October 4, 1819, and received his education in law at the University of Palermo, where he graduated in 1837, and began his studies for the magistracy. About 1843 he entered into the conspiracy that finally (1848) led to the overthrow of the kingdom of the Two Sicilies, and became at thirty years secretary of the revolutionary government that was established in Sicily. In 1849, with the Neapolitan occupation of Sicily, Crispi fled in turn to France, England, Malta, and Turin, where he lived in extreme poverty and obscurity, until in 1859 he returned to Italy to join Garibaldi in the expedition of "The Thousand" to Sicily. When the overthrow of Bourbon power in Crispi's native land was accomplished (1860), he became Garibaldi's secretary of state; and it was while he held this office that he declared his famous doctrine, "Monarchy unites us, a republic would divide us"—a policy rigidly adhered to throughout his varied political career. In 1861 he first took his seat in the Italian parliament and for 16 years was no more than a fairly active member of that body. When the radical element came into power in 1876 and Depretis was intrusted with the formation of the new administration, Crispi was made president of the Chamber of Deputies. In 1878 he was appointed minister of the interior and the opportunity for the exercise of his executive force seemed at hand. Soon afterward, however, the disclosure of his having put away his wife to marry his mistress and thereby legitimize a daughter she had borne him fifteen years before, furnished capital to his political enemies, which caused his resignation and kept him out of public life for nine years. The defeat of the Italians at Dagali (1887), in the war against the Abyssinians resulted in a ministerial upheaval that placed Crispi once more in the cabinet as minister of the interior under Depretis, upon whose death he was selected by the king to form the new cabinet. As premier, he ruled with iron power. In 1892, however, he resigned as the result of an investigation into certain irregularities in the management of the Banca Romana. A year later he returned to power and undertook at once to place Italy among the great colonizing nations of the world; but the crushing defeat of the Italians under General Baratieri (*q.v.*) by the Abyssinians at Adowa (1896) provoked a storm of popular indignation throughout Italy, the inevitable result of which was the resignation of the man whose name was so closely associated with colonial exploitation. Thereafter Crispi lived the life of a political recluse, still in the Chamber, but rarely participating in discussion. Conflicting views as to Crispi's motives obtain among those who attempt to fix his place in Italian history. An indomitable force, he of necessity made many enemies, who, assailing his private character, which was not impeccable, have asserted his dishonesty and lust for personal glory. What he was, may be left unsettled; what he accomplished, is a large portion in the achievement known as the "United Italy," with which his name is inseparably connected.

CROATIA and SLAVONIA, a division of the kingdom of Hungary, situated northwest of Bosnia, have an area of 16,773 square miles, and a population (1901) of 2,397,240. Agram, the capital, has 57,930 inhabitants, an increase of 49.5 per cent. in ten years. The country is directly under control of the Hungarian crown, which is represented by a viceroy, responsible to both the Hungarian prime minister and the Croatian diet. There is autonomy in home affairs, including justice and public instruction. The Croatian diet sends 40 members to the Hungarian parliament, and there is always one Croatian member in the Hungarian ministry. The revenue and expenditure balanced in the budget of 1900 at 18,576,165 kronen. Agriculture is the chief occupation. The principal products are wheat, rye, barley, oats, maize, and potatoes. The silk industry in 1898 gave occupation to 16,000 persons, and the product was valued at 330,516 kronen. The mineral products included coal, iron, and salt. There is a university at Agram and a number of gymnasia; commercial schools and primary schools are supported by the government, the total enrollment being over 215,000.

CROIZETTE, SOPHIE ALEXANDRINE (Mme. J. S. ANTOINE STERN), French actress, died in Paris, March 19, 1901. She was born at St. Petersburg, Russia, March 19, 1847, and was educated at Versailles, France. After an engagement at the

Paris Conservatoire she made her début at the Comédie Française in 1869 and won her first great success in *l'Été de la Saint Martin*, a one-act play by Meilhac and Halévy, following this with a triumph in *Jean de Thomeray*. It was in the rôle of *Sphinx*, in a play by M. Feuillet, that her acting provoked vigorous criticism for its audacious qualities. After appearing for a number of years in various plays by the poulger Dumas, Mme. Croizette (in 1880) followed Sarah Bernhardt in the rôle of Clorinde in *l'Aventurière*, and a year later created Lionnette in *la Princesse de Bagdad*. In 1885 she married and retired from the stage.

CROLY, JANE CUNNINGHAM ("Jenny June"), journalist and club woman, died in New York City, December 23, 1901. She was born at Market Harborough, England, December 19, 1829, and came to this country in 1839. In 1856 she married David Croly, a journalist, and for more than forty years afterwards she held editorial positions on various newspapers and magazines. Among these were the *Democratic Review*, the *Weekly Illustrated News*, the *Home Maker*, and *Godey's Magazine*. She was the New York representative of a number of southern newspapers. The *Woman's Cycle*, later the *New Cycle*, was founded by her in 1889 to further the interests of women, and she called the first Woman's Congress in New York in 1856. Mrs. Croly founded Sorosis, the oldest woman's club, in 1868, and served as its president, 1868-70, and 1876-86, and also the Woman's Press Club in 1889, of which she was president for a number of years. She published several books, including a cookery book, and one on the woman's club movement in America. In 1892 she became professor of journalism and literature in Rutgers Women's College, which institution conferred upon her the degree of L.H.D.

CROQUET (ROQUE). Croquet has developed into a highly scientific game and is receiving much attention in its newly specialized form. The twentieth annual tournament of the National Roque Association of America was held on the sanded, rubber-cushioned courts of the Association at Norwich, Conn., during August 19-22, 1901. There were entries from seventeen clubs. C. C. Cox, of Malden, Mass., won the Van Wickle gold badge. Honors for the national championship were tied between W. H. Wahley, of Washington, champion in 1898; C. C. Cox, of Malden; and George C. S. Strong, of New London, each with 11 out of 14 games. Wahley won on the play-off, defeating both his rivals in exciting games. The second division championship was won by H. P. Howard, Jr., of Washington, with 9 out of 10 games; second, A. L. Williams, of Washington, 7 games; Third division, Floyd Cronska Moosup, 9 out of 10; second, S. M. Crosby, New York, 7 games.

CROSSMAN, Sir WILLIAM, British major-general and member of Parliament, died in London, April 19, 1901. He was born at Cheswick, Northumberland, June 30, 1830, and was educated at the Royal Military Academy, Woolwich, becoming lieutenant in the Royal Engineers in 1848. General Crossman's military experience extended over a period of more than thirty-five years, during which time he was in charge (1866-69) of consular buildings in China and Japan, secretary to the Royal Commission in the defenses of Canada (1862), inspector of submarine defenses (1876-81), and commander of the Royal Engineers in the Southern District (1882-85). In 1885 he was elected to the House of Commons as a Liberal from Portsmouth. Later he became a Liberal-Unionist, refusing to support Mr. Gladstone in his Home Rule policy. He was created C.M.G. in 1876 and K.C.M.G. in 1884.

CRYOLITE. All of the cryolite used in the United States is obtained from Greenland, the imports in 1900 amounting to 5,437 short tons, valued at \$72,763, and those of 1899 were 5,879 short tons, valued at \$78,676. Cryolite, which is a fluoride of sodium and aluminum, is used in the manufacture of aluminum, sodium salts, hydrofluoric acid, and opalescent glass.

CUBA, the largest island of the West Indies, is, from Cape Maysi on the east to Cape San Antonio on the west, 730 miles in length. Its breadth ranges from 100 miles in the east in the Province of Santiago to 25 miles in the neighborhood of Havana. No exact measurements of its area have been made, and there is a variation of 2,575 miles between the area of 46,575 square miles given by the United States Coast and Geodetic Survey, and that of 44,000 square miles, given by the Information Division of the War Department. The six provinces into which Cuba is divided for administrative purposes have areas as follows: Havana, 2,772 square miles, Matanzas, 3,700 square miles; Pinar del Rio, 5,000 square miles; Puerto Principe, 10,500 square miles; Santa Clara, 9,560 square miles; Santiago, 12,468 square miles. The population of Cuba, according to the census taken by the United States military authorities in 1899, was 1,572,797. Of this population, native whites represented 57.8 per cent.; foreign whites, 9 per cent.; negroes, including those of mixed descent, 32.3 per cent., while the Chinese represented less than 1 per cent. The population by provinces was as follows: Havana, 424,804, including the city of Havana with 235,981; Matanzas, 202,444; Pinar del Rio, 173,064; Puerto Principe, 88,234; Santa Clara, 356,536; Santiago, 327,715.

Finances.—The following table, prepared by the Division of Insular Affairs of the War Department, shows the revenues and expenditures of Cuba for the fiscal years 1900 and 1901:

REVENUES.		
	1900.	1901.
Customs	\$16,068,035.90	\$15,945,666.42
Postal	258,237.17	367,950.28
Internal	884,783.29	658,535.92
Miscellaneous	174,848.99	182,736.96
Total	\$17,385,905.35	\$17,154,939.58
EXPENDITURES.		
Customs	841,376.59	910,993.66
Postal	494,539.09	524,198.85
All other	14,355,537.38	16,209,802.30
Total	\$15,691,453.06	\$17,644,994.81

Agriculture.—Judged by export figures, the year 1901 was a prosperous one for the farming interests of Cuba. Comparing the statistics of exports to the United States for the eleven months ending in November with the same period of 1900 it will be seen that there was a material increase in the principal crops. Sugar exports rose from 651,497,257 pounds in 1900 to 1,259,106,823 pounds for the eleven months' period of 1901; and tobacco, leaf and cigars, from 12,678,949 pounds in 1900 to 16,472,552 in 1901. The difficulty of securing sufficient labor to cultivate the land was again experienced in 1901. The most widely discussed and apparently vital question that arose in connection with Cuban agriculture was that of reciprocal tariff concessions between the United States and the island. (See paragraph The Sugar Question.) The contention of a large number of planters is that without some reduction of the duty on sugar and tobacco it will be impossible for them to compete in the only important market available—the United States—against the protected beet-sugar industry and the prohibitively protected manufactured tobacco products. In both sugar and tobacco, however, the amount of exports to the United States increased, tobacco about 25 per cent. and sugar nearly 50 per cent. over the amounts exported in 1900. As applied particularly to tobacco, the demand for the reduction of duty of 20 per cent., which represents the minimum reduction agreed to by the planters, is based upon the desire to compete with the cigar makers of the United States. The duty on cigars is \$4.50 per pound and 25 per cent. ad. valorem; and it is stated that, counting the cost of shipping, cigars which cost in Cuba \$30 per thousand can not be delivered in the United States for less than \$93.50 per thousand. At this price, the Cuban tobacco growers assert, it is impossible to compete with the trade in American made cigars. American cigar makers, on the other hand, maintain that any reduction of duty on cigars and cigarettes will result in lowering the pay of the workers in the Florida factories, where most of the imported Cuban leaf tobacco is manufactured, and in the inevitable reduction in the price of the better grade of cigars. While the Cubans demand the privilege of turning their growth of leaf tobacco into the finished product on their own estates and with their own labor, the manufacturers of the United States prefer to keep the duty on leaf tobacco down to a mere nominal rate and keep their factories at work. The American manufacturers contend that with a lightening of the tariff charges Cuban manufacturers would import Porto Rican tobacco, which is of inferior quality, make it up and sell it for the Cuban product. The Cubans assert that this practice, once confessedly resorted to, has been definitely abandoned. Little opposition to the tariff reduction asked comes from the American tobacco growers, for their product is of an admittedly lower grade, the best of which is used for wrappers, but not capable of competing with the Havana grades.

Cuban Commerce.—The statistics of Cuban commerce for the fiscal year ending June 30, 1901, show total imports of \$65,050,141, of which \$28,078,702 came from the United States, and exports of \$63,115,821, of which \$45,497,468 went to the United States. These figures show a decrease of imports over the previous year and an increase of exports. For the fiscal year 1900, the total imports to Cuba were \$71,681,187, of which \$28,078,702 came from the United States, while the exports in 1900 amounted to \$45,228,346, of which \$34,621,879 went to the United States. In 1892, which may be taken as an ordinarily prosperous year under the Spanish régime, the imports to Cuba were \$64,000,000, and the exports, \$93,000,000. It will be seen then that though the imports are not below what they were before the war, owing for the most part probably to renewed purchase for improvements made by

the Cuban sugar planters in the hope that the United States tariff would be lowered in their behalf (see paragraph The Sugar Question), the exports of Cuban crops and more especially of Cuban sugar, are still far below their normal amount. The increased exports of Cuba for the fiscal year 1901 were largely accounted for by the increased exports of sugar and tobacco. The exports of sugar and molasses and its manufactures amounted in 1900 to \$18,668,797, and in 1901 to \$28,224,955. The exports of tobacco manufactures amounted in 1900 to \$21,712,655, and in 1901 to \$28,906,040. The United States in 1901, as in 1900, took practically all the sugar that was exported. But while the exports of tobacco increased during the year by over \$5,000,000, the United States took only some \$300,000 more in 1901; the figures being respectively \$12,934,339 in 1900 and \$13,175,793 in 1901. The only other considerable exports of Cuba were cocoa, \$281,211 in 1900 and \$514,062 in 1901; vegetables and fruits, \$584,756 in 1900, and \$1,062,371 in 1901; wood and manufactures of wood, \$1,565,952 in 1900, and \$1,289,258 in 1901, and vegetable fibres, \$649,959 in 1900, and \$1,204,577 in 1901. Of imports to Cuba may be mentioned wheat flour to the amount of \$2,154,702 in 1900, and \$2,206,759 in 1901; coffee, \$1,679,796 in 1900, and \$2,082,945 in 1901; rice, \$3,414,388 in 1900, and \$3,335,721 in 1901; wines and liquors, \$3,508,807 in 1900, and \$2,727,279 in 1901; animals and animal products, \$11,759,248 in 1900, and \$8,476,509 in 1901; meats and meat products, \$5,931,943 in 1900, and \$8,791,689 in 1901; oils, etc., \$1,293,040 in 1900, and \$2,598,988 in 1901; boots and shoes, \$2,291,362 in 1900, and \$1,638,084 in 1901; cotton and manufactures, \$7,078,023 in 1900, and \$6,067,939 in 1901; vegetable fibres, \$3,394,250 in 1900, and \$2,056,824 in 1901; wood and manufactures, \$1,014,194 in 1900, and \$2,667,027 in 1901; machinery, etc., \$2,459,493 in 1900, and \$2,495,417 in 1901; iron and steel manufactures, \$1,163,892 in 1900, and \$2,988,002 in 1901; other metals and manufactures, \$1,460,125 in 1900, and \$821,184 in 1901.

As stated by the secretary of war, of the \$37,000,000 of merchandise which Cuba imported in the fiscal year ending June 30, 1901, from countries other than the United States and of the much greater amount which they would import if prosperous, and with proper reciprocal tariffs, a large part would inevitably come from the United States. An examination of the figures of Cuba's commerce shows that in 1901 the United States supplied less than \$500,000 of over \$6,000,000 worth of cotton goods imported; less than \$22,000 of nearly \$700,000 worth of woollen goods; less than \$171,000 of over \$2,000,000 worth of vegetables and vegetable fibres; less than \$329,000 out of over \$2,700,000 worth of wines; only \$713,000 out of nearly \$2,598,000 worth of oils; only \$422,000 out of \$1,053,000 worth of chemicals and drugs; only \$1,994,000 out of \$8,476,000 worth of animals and animal products; only \$405,000 out of \$1,638,000 worth of manufactures of leather, and only \$3,000 out of \$3,335,000 worth of rice. Substantially the whole of these articles might under proper conditions come from the fields and factories of the United States.

The Sugar Question.—During the whole year, and especially in the late autumn, when Cuba's sugar crop was ready to be cut, the question of what concessions, if any, the United States would grant to Cuba's sugar exports was widely discussed and was admitted to be of the utmost significance to the whole industrial situation of the island. The case of Cuba as presented by the president, secretary of war and by General Leonard Wood, the military governor of the island, was simple in character, and may be stated substantially as follows: In the three years since the island had been under the authority of the United States, the entire machinery of education, charities, sanitation, laws and administrative methods had been reconstructed or replaced. So far as a carefully drawn constitution, free elections held thereunder and the expressly stipulated authority of the United States to intervene to protect Cuba from domestic insurrection or from foreign aggression, could do so, provision had been made to insure a tranquil, stable and republican form of government. But no government could long endure, and no considerable state of civilization be maintained where the people were impoverished and left without means or hope of ordinary material welfare. And to this state it was asserted Cuba had been brought and could not be extricated unless tariff concessions were made by the United States. For the wealth of Cuba consisted, broadly speaking, in her tobacco and, more especially, in her sugar crops. For these products her natural, and in fact her only market, was the United States. But from the United States, Cuba was debarred by the high tariff wall erected by the United States against all foreign countries. And, therefore, the sugar question in Cuba, reduced to simplest terms, was whether the United States tariff wall should be lowered, or whether the administrative labors of the United States in Cuba for three years past, together with the expenses and purpose of the Spanish War, should be allowed to go to waste coincidentally with the waste of the Cuban sugar-cane fields. The argument on the subject resolved itself into, first, a statement of undisputed fact as to Cuba's position in the sugar markets of the world and of the United States; and, second, a controversy as to the effect upon the United States' sugar industry that would result from

giving Cuban sugar a virtually free access to this country. The statement of fact and the ensuing argument may be stated as follows:

Cuba's Position in the Sugar Markets of the World.—Owing to direct or indirect bounties on beet sugar offered by all the important European countries to their domestic producers, the world's production of sugar (See article SUGAR INDUSTRY) has increased rapidly of late years, and now largely exceeds the demand. Europe produces over twice as much sugar as she consumes, and as this surplus must either be sold or become a total loss, the domestic consumer is forced by various governmental devices to pay a high price for his sugar, thus allowing the producer to export sugar at or below the cost of production. In this way excessive pressure is brought to bear by the sugar-selling countries upon every market for sugar in the world, the cane sugar of the West Indies is driven out of competition, and England and the United States, the only two great sugar-importing countries, are made the especial dumping grounds for the bounty created sugar of the continent. In England, where no countervailing duties are charged upon bounty exported sugar, Cuba cannot possibly sell her sugar except at a loss, and therefore the only resource left to her is to persuade the United States to grant such a reduced tariff as will open a sugar market to her.

That Cuba has not at present a profitable market in the United States may be shown by the prices for sugar prevailing in the United States in 1901. The average cost of raw sugar to refiners in that year, that is, the average market price, was 4.047 cents a pound. Now the average duty on imported sugar is 1.68 cents a pound; ocean freights from Cuba, lightering, packing, and shipping charges, aggregate .35 cents a pound more; so that the Cuban manufacturer receives for his sugar less than 2 cents a pound when delivered at the port of shipment. As the price of the cane ranges from 1 cent to 1.25 cents a pound, this margin of less than 1 cent a pound for all expenses connected with the manufacture of raw sugar entails a loss estimated at about one-half a cent a pound. Hence to permit Cuban sugar to be sold at a reasonable profit in the United States, it is estimated that the sugar duties must be reduced at least 50 per cent., that is to say, from 1.68 cents a pound to .80 cent a pound or thereabouts. That the admission of Cuban sugar on these terms, even assuming that the entire crop would come to the United States, would not bring about a glut in the United States markets may be shown as follows:

The consumption of sugar in the United States for the calendar year 1901 was 2,372,316 tons, of which amount 439,986 tons was of domestic production; 380,499 tons were from Hawaii, Porto Rico and the Philippines, leaving imported tariff paying sugar to the amount of 1,551,861 tons. Of the tariff-paying sugar, 559,800 tons came from Cuba, leaving, in the rough, 1,000,000 tons imported from other countries. Now while the Cuban sugar crop may be increased greatly under improved industrial conditions, and with the assurance of a ready nearby market, and while the Cuban crop is in fact estimated at 875,000 tons for the crop year 1901-02, as against 635,856 tons for the preceding year, the fact nevertheless remains that the consumption of sugar in the United States increases at the rate of about 100 per cent. in every fifteen years, or more rapidly than the most optimistic estimates of the possible increase of the Cuban sugar crops. At the same time, the domestic production of sugar in the United States, including the production of the Philippines, Porto Rico, and Hawaii, is stated to be incapable of any large increase in the near future. And, therefore, allowing for a large annual increase in Cuba's sugar crops, the United States would still be forced to import annually one million tons of sugar. This estimate, however, leaves out of consideration the increase of beet sugar production in the United States, and it is precisely from the beet sugar interests that nearly all opposition comes against reducing the tariffs on Cuban sugar.

Beet Sugar vs. Cane Sugar.—The beet sugar industry in the United States has been practically developed to its present point within the last ten years. In the crop year 1892-93, the beet sugar crop of the country was 12,018 tons; in the crop year 1899-1900, it was 72,944 tons; for the crop year 1901-02, it was estimated at 150,000 tons. Evidently the possible increase of an industry which has made such strides within ten years is very great. Its advocates claim that it may become relatively as important in this country as it is in Germany. It depends upon intensive culture, and flourishes in sandy soil inapplicable to other crops. Moreover, the sugar beets may be produced very cheaply and at the same time return under present conditions a large profit, both to the farmers and to the beet sugar manufacturers. How cheaply beet sugar may be made is shown by the fact that Mr. Henry T. Oxnard, the spokesman of the industry, estimated in 1899 that refined beet sugar could be produced at 3.1 cents per pound, while since then other experts have claimed that it could be produced even cheaper, or at from 2.5 cents to 3 cents per pound. If these figures are correct, the beet sugar manufacturers are enabled to clear nearly 100 per cent profit on every pound of sugar sold. For the American Sugar Refining Company, which sets the price of sugar, is unable, owing to the existing tariff on im-

ported sugar, to sell refined sugar at less than 5 cents per pound. From this fact has arisen on the one hand a demand that Cuban sugar should be admitted free, and, on the other hand, a strong opposition to any lowering of tariff duties whatever. For the manufacturers of beet sugar are naturally desirous of retaining their present strategic advantage over the sugar trust; and in this they are backed by the beet sugar producers who see larger and further profits accruing to them. The sugar trust wishes to have the price of raw sugar reduced so as to prevent the beet sugar manufacturers from underselling it, and so capturing a part of its trade. The sugar trust has no objection to the domestic production of raw beet sugar, but it does object to the refining of the sugar by independent companies. Of the total amount of refined sugar amounting to 2,178,615 tons consumed in the United States in 1900, 67.3 per cent. was manufactured by the sugar trust, 28.7 per cent. by independent refineries, 9 per cent. by foreign refineries, and 3.1 per cent. by the sugar beet factories. To increase their relative proportions of the total amount of sugar refined, the beet sugar men oppose the lowering of Cuban tariffs, while the sugar trust advocates it. The arguments of the beet sugar interests were virtually as follows: It was alleged, first, that free trade with Cuba would not reduce the price of sugar in the United States, as the sugar trust would maintain the price and pocket the difference; second, that the increase in domestic beet sugar production had at present no appreciable limit, but that a limit would be arbitrarily placed upon it if Cuban sugar was admitted free, or if the sugar tariff were greatly reduced; third, that a large and unnecessary loss of revenue to the United States treasury would be caused by reducing the tariff; fourth, that the United States had already done enough and to spare in behalf of Cuba, and that its first duty in the present case was to its own producers, according them full protection as had been done in the case of all other domestic industries, especially in their experimental and developing stage. The trust argued, on the other hand, that free imports of Cuban sugar would greatly increase sugar consumption in the United States by lowering prices, and that this would not only be of advantage to the great body of consumers, but would materially aid such industries as the fruit preserving and confectionery interests; second, that the beet sugar producers and manufacturers were in no need of protection, as was shown by their own statements, and by the known facts of the cost of beet sugar production; third, that by lowered sugar tariffs, exports to Cuba would be greatly stimulated, and investors in Cuba would be enabled with the returning prosperity of the island to make large returns on capital invested.

Cuba's Need of a Sugar Market.—That the conflicting arguments and interests noted above would be largely instrumental in determining Congress as to what should or what should not be done for Cuba's sugar industry was hardly gainsaid. But these arguments and interests, based primarily on profits desired by rival industrial organizations, and only incidentally upon the necessities of Cuba, did not appeal to the public and the press, which were more inclined to consider Cuba's needs and the obligations of the United States to Cuba. As stated by the secretary of war in his annual report for 1901, Cuban planters relying upon generous treatment by the United States had made great efforts to revive their sugar industry, raising the product of sugar from 308,000 tons in 1899 to 615,000 tons in 1900 and to something like 800,000 tons in 1901. All the capital they had or could borrow had been invested in the rebuilding of their mills and the replanting of their land. More than half the people of the island were directly or indirectly dependent upon the success of the industry. If it succeeded, peace, plenty and domestic and political quiet might be expected; if it failed, the great body of laborers would be thrown out of employment, and poverty, starvation and anarchy would ensue. From the commercial side (see paragraph Commerce) it could hardly be doubted that the prosperity of Cuba and reciprocal trade relations with the United States would bring to this country far more prosperity than the starving out of Cuba and the loss of trade relations for the sake of a problematical enormous increase of beet sugar production in the United States. Politically, moreover, since Cuba had agreed to the doctrine of the United States (see paragraph Relations to the United States) that she should not put herself in the hands of any other power whatever her necessities or however impoverished and desperate her people, the correlative obligation rested upon the United States to treat her not as an enemy, but with due consideration for her welfare. Finally, there were the weightiest reasons of public policy based upon the strategic condition of Cuba toward the United States why the prosperity of Cuba should be sustained. For, as stated by the secretary of war, "the peace of Cuba is necessary to the peace of the United States; the wealth of Cuba is necessary to the wealth of the United States; the independence of Cuba is necessary to the safety of the United States; the same conditions which led to the war with Spain now require that a commercial requirement be made under which Cuba can live."

Constitutional Convention.—In accordance with the Congressional resolution of April 20, 1898, disclaiming any intention on the part of the United States to exer-

cise jurisdiction over Cuba beyond the time needed for the establishment of the Cuban government, an order was issued by the war department on July 31, 1900, providing for the election in Cuba on September 15 of a constitutional convention composed of thirty-one delegates from the different provinces of the island, who should frame and adopt a constitution for the people of Cuba. This convention opened on November 5, and the constitution it adopted was completed and signed on February 21, 1901. In general the form of the constitution is similar to that of the United States, the two most noticeable differences being the excessive safeguards thrown around individual rights and the extreme centralized form of government provided for. As instances of the rights guaranteed to individuals may be mentioned the following: Retroactive penal laws operating in favor of the criminal are permitted; relatives within the fourth degree of consanguinity or second of affinity are not obliged to give testimony against each other; private residences are, without the consent of the owner, to be considered inviolable to the extent that they can be entered at night only in case of sudden accident or crime; no person may be arrested except by warrant, and this warrant must be confirmed or vacated after a hearing and within seventy-two hours after the arrest; finally, suffrage is made practically universal, all male Cubans over twenty-one years of age and not mentally incapacitated or convicted of crime being entitled thereto. As showing the reason for the centralized government adopted, it is to be remembered that the several provinces of Cuba were never accustomed to much political autonomy, and that, if the province of Santiago, whose inhabitants are largely negroes, is excluded, the needs and political genius of the provinces are not sharply different from one another, as in many of the States of the United States, but correspond rather to the counties of a single State. Notwithstanding these facts, however, the government provided for may perhaps be considered as unduly centralized, since its functions include, for example, an absolute control over electoral matters, provincial and municipal, management of all public education, and "the general administration of public provincial and municipal affairs." By a series of checks, moreover, all final authority in the island is given to the president and through him to Congress; for while Congress can impeach the president, the president in turn can suspend the governors of provinces and also the decrees of provincial and municipal councils. In turn, again, governors of provinces can suspend provincial decrees and the mayors of municipalities, and finally the mayors can suspend the decrees of their own municipal councils. In a possible case then, if political excitement ran high, Congress could exercise authority over the acts of the smallest municipalities. For Congress could order the president, under threat of impeachment, to direct the governor of a province, under pain of suspension, to command the mayor of a municipality, under a similar threat of suspension from the governor, to suspend any and every decree of municipal council. While this particular case would probably never arise, yet a less direct and far extending sort of coercion might easily take place, and the possibilities of the system for facilitating political jobbery can hardly be gainsaid. On the other hand, the convention acted with great conservatism in many ways, and in some respects, as for example in having senators chosen by a joint body composed of the provincial councilmen acting in conjunction with double that number of electors chosen by popular vote, instead of having them chosen directly by the councilmen; the convention apparently took heed of defects which have exhibited themselves in the workings of the constitution of the United States. Summing up the whole matter the secretary of war stated in his report for 1901: "I do not fully agree with the wisdom of some of the provisions of this constitution; but it provides for a republican form of government; it was adopted after long and patient consideration and discussion; it represents the views of the delegates elected by the people of Cuba; and it contains no features which would justify the assertion that a government organized under it will not be one to which the United States may properly transfer the obligations for the protection of life and property under international law, assumed in the Treaty of Paris." The main provisions of the constitution are given in the succeeding paragraph.

Provisions of the Constitution.—Fundamental rights and guarantees: The constitutional convention meeting to establish "a government capable of fulfilling its international obligations, maintaining public peace, insuring liberty, justice, and promoting the general welfare," adopted the following constitution: Cuba is constituted "a sovereign and independent state," with "a republican form of government." The territory of the republic is composed of Cuba and its adjacent keys and islands, and is divided into the six provinces—Havana, Matanzas, Pinar del Río, Puerto Principe, Santa Clara, Santiago—now existing, but these divisions may be altered at will by acts of the provincial councils approved by Congress. The people of Cuba are those born within Cuba or of Cuban parents; Spaniards having acquired Cuban citizenship, and foreigners residing in Cuba for not less than five years and claiming naturalization. All male Cubans over twenty-one years of age, not mentally incapacitated or

convicted of crime, are entitled to the right of suffrage. To Cubans and foreigners alike certain individual rights are guaranteed, of which the following may be especially mentioned as differing from those familiar to English jurisprudence. No laws shall be retroactive "other than penal ones favorable to convicted or indicted persons." No person shall be arrested except by warrant of a competent judge or court, and such prisoner shall be given a hearing and the order for his arrest vacated or confirmed within seventy-two hours after his apprehension; but this provision may be suspended in case of peril to the state. "No person whatever is bound to give evidence against himself, nor husband and wife against each other, nor relatives within the fourth degree of consanguinity or second of affinity." "In no case shall the penalty of death be imposed for crimes of a political nature." Primary education shall be compulsory and gratuitous, and the state shall defray the expenses thereof until the provinces and municipalities are able to do so. The state shall also control secondary and advanced education as well as determine the conditions for the practice of the professions; but private educational institutions may nevertheless be freely established. The laws shall guarantee minority representation in all electoral matters in the house of representatives and in the provincial and municipal councils.

The Legislative Power.—The general legislative power of Cuba is vested in a senate and house of representatives. The senate is composed of four senators from each province, elected for eight years by the provincial councilmen acting in conjunction with electors double in number to the councilmen, and chosen by popular vote. The house is composed of one representative for each 25,000 inhabitants, elected for four years. One-half of the senate is renewable every four years, and one-half of the house every two years. Only native-born Cubans are eligible to the senate, but members of the house may be either native-born Cubans or naturalized Cubans who have resided in the republic at least eight years since their naturalization. Congress, consisting of the house and senate, is to hold two regular sessions each year, convening on the first of April and on the first Monday of November, and it may hold extra sessions either on its own initiative or when convened by the executive. The power to regulate and develop internal and external commerce, railroads, post roads, harbors, and canals is vested in Congress, and Congress is also charged with the duty of making rules for general, provincial, and municipal elections and of issuing orders "for the regulation and organization of all matters pertaining to the general administration of public, provincial, and municipal affairs." The initiative of all bills is vested equally in both houses, but no bill defeated in its entirety may again be considered in the same session. Treaties must be ratified by the senate, which is also authorized to sit as a court of impeachment to try the president of the republic, cabinet ministers, and governors of provinces on charges of violating the constitution, or of crimes "against the free exercise of legislative or judicial power." Loans when authorized either by Congress or by the provincial or municipal councils must receive the affirmative consent of two-thirds of all the members of the contracting body, and provision must be made at the same time insuring both payment of interest and final redemption of the loans.

The Executive Power.—The executive power is vested in the president, or, in case of his death or disability, the vice-president; both officers are elected by popular vote for a term of four years, and are disqualified from serving for three successive terms. The president must be at least forty years of age and must be either a native-born Cuban or a naturalized Cuban having served ten years in the Cuban wars for independence. All decrees, orders, and decisions of the president must bear the *referendum* of the cabinet minister in whose department they lie, and each cabinet minister is held personally responsible for decrees sanctioned by him. Governors of provinces may be suspended by the president for cause, pending an appeal to the senate, whose decision in the matter is final. The president is also authorized to suspend the resolutions of the provincial and municipal councils; but the illegality of these resolutions must then be affirmed by the courts. In general, the duty of the president is to sanction, promulgate, execute, and enforce the laws; to veto congressional bills which meet his disapproval and which must then be reenacted by a two-thirds vote to become law; to appoint, with the consent of the senate, diplomatic and consular officers and justices of the supreme court; to negotiate treaties and to take measures for the defense of the territory and the maintenance of public peace.

Provincial and Municipal Government.—The executive and legislative power of each province is vested in a governor and in a council of not less than eight or more than twenty members, elected by direct vote. The council has the right to decide all affairs concerning the province which are not within the general jurisdiction of the state or the special jurisdiction of the municipalities; but the council is prohibited from legislating in any way concerning election matters, and all resolutions of the councils deemed contrary to the laws and the constitution may be suspended by the governor of the province or the president of the republic, pending an appeal to the courts. Moreover, councilmen are personally liable for all acts committed by them

in the discharge of their official duty. The municipal governing power consists of a mayor and of a municipal council, both elected by popular vote. The mayor may be suspended for cause by the provincial governor, the resolutions of the municipal council may be suspended by the president, the governor, or the mayor, and both mayor and councilmen may be held personally responsible for their official acts.

Other Constitutional Provisions.—The judicial power is vested in a supreme court of justice and in such other courts as may be established by law. Justices of the supreme court must be Cubans by birth, thirty-five years of age or over, and must have practiced their profession for at least ten years. Cuba does not recognize any debts and obligations other than those legitimately contracted in behalf of the revolution subsequent to February 24, 1895. The laws and orders in force at the time of the promulgation of the constitution are to remain binding, so far as they do not conflict with the constitution, until they are revoked or amended. Amendments to the constitution are to be made by resolutions adopted by two-thirds of all the members elected to each house of Congress and approved by a constitutional convention consisting of one delegate to each 50,000 inhabitants in Cuba, elected by popular vote and convening within six months after the resolutions have been adopted by Congress.

Relations to the United States.—By order of Secretary Root the Cuban constitutional convention, which had at first been directed to embody in its constitution the relations which the convention considered Cuba should bear to the United States, was later instructed not to consider these relations until the constitution itself had been completed. So it was not until February 21, when the Cuban constitution (see paragraph Constitutional Convention) was signed, that General Wood, the military governor, communicated to the convention the provisions as to the future relations with the United States which the President thought Cuba should accept. These provisions were in substantial agreement with the first five of those contained in the so-called "Platt amendment" (see UNITED STATES, paragraph Congress), passed by the Senate on February 27 and by the House in March 1, as a rider to the Army Appropriation Bill, under the spur of the threat of an extra session of Congress. The full text of the Platt amendment, whose object is defined in its preamble, is as follows: "That in fulfilment of the declaration contained in the joint resolution approved April 20, 1898, entitled 'For the Recognition of the Independence of the People of Cuba,' demanding that the government of Spain relinquish its authority and government in the island of Cuba, and withdraw its land and naval forces from Cuba and Cuban waters, and directing the President of the United States to use the land and naval forces of the United States to carry these resolutions into effect, the President is hereby authorized to leave the government and control of the island of Cuba to its people as soon as a government shall have been established in said island under a constitution which, either as a part thereof or in any ordinance appended thereto, shall define the future relations of the United States with Cuba, substantially as follows:

"1. That the government of Cuba shall never enter into any treaty or other compact with any foreign power or powers which shall impair or tend to impair the independence of Cuba, nor in any manner authorize or permit any foreign power or powers to obtain by colonization or for military or naval purposes or otherwise, lodgment in or control over any portion of said island.

"2. That said government shall not assume or contract any public debt to pay the interest upon which and to make reasonable sinking-fund provision for the ultimate discharge of which the ordinary revenues of the island, after defraying the current expenses of government, shall be inadequate.

"3. That the government of Cuba consents that the United States may exercise the right to intervene for the preservation of Cuban independence, the maintenance of a government adequate for the protection of life, property, and individual liberty, and for discharging the obligations with respect to Cuba imposed by the Treaty of Paris on the United States, now to be assumed and undertaken by the government of Cuba.

"4. That all acts of the United States in Cuba, during its military occupancy thereof, are ratified and validated, and all lawful rights acquired thereunder shall be maintained and protected.

"5. That the government of Cuba will execute, and as far as necessary extend, the plans already devised, or other plans to be mutually agreed upon, for the sanitation of the cities of the island, to the end that a recurrence of epidemic and infectious diseases may be prevented, thereby assuring protection to the people and commerce of Cuba, as well as to the commerce of the southern ports of the United States and the people residing therein.

"6. That the Isle of Pines shall be omitted from the proposed constitutional boundaries of Cuba and the title thereto left to future adjustment by treaty.

"7. That to enable the United States to maintain the independence of Cuba and to protect the people thereof as well as for its own defense, the government of Cuba

will sell or lease to the United States lands necessary for coaling or naval stations at certain specified points to be agreed upon with the President of the United States.

"8. That by way of further assurance, the government of Cuba will embody the foregoing provisions in a permanent treaty with the United States."

Of the stipulations of the Platt amendment given above, those which were principally criticised, both in this country and in Cuba, were the third, sixth, and seventh, respectively, permitting the United States to intervene in Cuba for cause, binding Cuba to sell or lease naval or coaling stations to the United States, and leaving the title to the Isle of Pines to future negotiations between the two countries. The Isle of Pines, in the first place, had always been considered to be within Cuban boundaries, and it was only through lack of specific mention in the Treaty of Paris that it became technically one of those "other islands in the West Indies" ceded by Spain to the United States. By many, therefore, it was considered unfair for the United States thus to take advantage of a seemingly accidental omission in the treaty. As to the other two amendments, opponents of the administration considered that the demands made by Congress were far too sweeping, that they permitted the United States to intervene at will in Cuba, and that they in effect annulled the sovereignty of the future Cuban government and substituted for it what amounted practically to an American protectorate. On the other hand, many persons thought that the acceptance by Cuba of these two latter amendments was necessary in view of the organic political instability of the Cuban people and their inexperience in self-government, as a guarantee for the maintenance of a republican form of government in the island, and that the amendment authorizing United States naval stations in Cuba was also of great military importance to the United States. For if the United States did not hold naval stations in Cuba, foreign powers desiring in case of war to proceed against either the United States or Cuba might easily obtain a naval base in Cuban harbors, and the United States would be placed at an extreme strategic disadvantage either in protecting Cuba or her own shores. Finally, as it was the purpose of the United States to secure independence for Cuban citizens the right to intervene in Cuba was necessary not only in event of foreign aggression, but in case of internal disorders beyond the power of the central Cuban government to control. Presumably for these reasons so eminent an anti-imperialist as Senator Hoar stated that he considered the Platt amendment as proper and desirable.

On April 13, 1901, the Cuban convention, which did not look with favor upon the amendment, appointed a committee of five to learn its precise intent from the President at first hand. On the basis of the report of this committee, the Cuban convention on May 26, by a vote of 15 to 14, agreed to the amendment, as modified by their understanding of the President's explanations, given through Secretary Root, and as further modified by a series of resolutions added by the convention and defining or limiting each clause of the amendment. Of the qualifications made by the resolutions the most important were that the naval stations given to the United States by Cuba should in no case be used as "vantage points" for intervention in Cuba, but should be held solely to repel foreign aggression; that Cuba did not necessarily agree to carry out the plans for municipal sanitation already devised by the United States, but only such plans as might be "mutually agreed upon;" that intervention in Cuba should not take place without the "formal action of the United States;" that with the exception of foreign alliances militating against her independence, Cuba might freely "make political and mercantile treaties with any nation," and that while Cuba consented that the Isle of Pines should be omitted from her proposed constitutional boundaries, and its ownership left to treaty negotiations, still Cuba believed that the island was "actually comprehended within her boundaries." On May 31, the administration decided that the amendment as thus variously modified could not be accepted. For in the first place the convention had given to the unofficial explanations of Secretary Root the binding force of *dicta* of "the government of the United States," and in the second place the executive branch of the government could not, if it would, usurp the powers of the legislative branch and sanction the qualification of a definite law of Congress. On June 12, therefore, the convention, by a vote of 16 to 11, voted that "the constitutional convention proceeding in conformity with the order of the military governor of the island—has determined to add and does add to the Constitution of the Republic of Cuba, adopted on February 21," the full text of the Platt amendment without any change or qualification whatsoever.

Postal Frauds.—The United States Supreme Court on January 14, 1901, decided that the case of the government against C. F. W. Neely, former treasurer of the Department of Posts in Cuba, accused of fraudulent practices while in office, could be conducted at Havana. The point in dispute was as to whether the military occupation and control of the island by the United States was legal and sufficient to make it a part of the United States, so that extradition proceedings might not be required. The court decided that the occupation *was* legal and that extradition was not necessary, and on January 21 the State Department issued a warrant for the surrender of Neely to the Cuban authorities. After a long series of delays the trial

CUBAN ASSEMBLY COMMISSION.—Commission Sent by Cuban Convention to Confer
with President McKinley.

of Neely and of E. G. Rathbone, former Director of Posts, was begun at Havana; and at the end of the year the trial was still in progress. Neely was charged with criminally appropriating funds of the department to his own use, with bribery of subordinates, and with manipulating the books so as to conceal discrepancies. Rathbone was put on trial on the charge of collusion with Neely and misappropriation of funds through undue extravagance in personal expenses.

General Conditions.—Progress in systematizing the government of Cuba and placing its institutions under efficient and economical management went on steadily during the year. In pursuance of the plan of training the people to govern themselves after the United States government had withdrawn from the island, a rural guard was organized, including a total of 1,300 men and officers. The control of the municipal police was taken from the central government and placed under the municipalities, and several companies of Cuban troops were organized and assigned to coast artillery defense. By the end of the year, 34 hospitals were established, containing 2,844 beds, and 6 training-schools for female nurses had been instituted under the tuition of American trained nurses. The government training-schools for boys and girls were enlarged. The lepers of the island were gathered into two central institutions. Extensive improvements were made in the insane asylums, the prisons were repaired and each jail was provided with a physician and necessary medicines. School instruction also was introduced in the larger jails. Extensive repairs of streets and sanitary work was done in Havana, Santiago, Cienfuegos, and Santa Clara; sewerage and paving plans for Havana were completed, and a contract for \$555,000 for the improvement of Matanzas harbor was awarded. The school law practically giving the management of schools over to the localities concerned was said to have worked satisfactorily. Local boards of education to the number of 121 were elected by the people under this system. The work of changing the old military barracks into schools was continued, \$250,000 being expended for this purpose during the year. Besides this, large schools were established by changes in government buildings at Guines, Pinar del Rio, Matanzas, Ciego de Avila, and Colon, and a thoroughly modern school was placed under construction at Santiago, estimated to cost \$50,000. There were some 3,600 teachers employed during the year, with an average enrollment of pupils of 180,000, and an average attendance of 140,000. While the schools are now generally well supplied with modern books and furniture, there is stated to be still a great need for additional schoolhouses and thoroughly instructed teachers. The judiciary system does not yet work well, owing to the inbred prejudices of the Cubans for the spoils system. As stated by the secretary of war, the number of men suitable for a judicial career in Cuba is limited, and the working of the jury system is not satisfactory. Extensive state aid was furnished to indigent farmers during the year by the distribution of cattle, over 100,000 farmers being assisted in this way. The vexed question of what should be done with the large amount of real estate held by the government but claimed by the Roman Catholic Church, as also what disposition should be made of the mortgages held by the government, was satisfactorily settled during the year. The land formerly owned by the church was turned over to the United States by the Spanish crown, which had occupied it, in accordance with a long series of negotiations between the crown of Spain and the Holy See. When the United States declined to pay for the maintenance of the Catholic Church in Cuba, as the Spanish government had done, the church demanded that its property should be returned. A judicial commission appointed to consider the rights of the Church in the premises rendered a decision in its favor, and the military government then agreed to pay a rental of 5 per cent. upon the appraised value of the property, amounting to about \$2,000,000, with a five years' option to the government of Cuba, when organized, to buy the property at this appraised value. With regard to the mortgages held by the government upon property in different parts of the island, an adjustment was made by which the military governor took up the mortgages at 50 cents on the dollar and allowed the debtors interested to purchase them at the same rate.

Conditions in the island were uniformly peaceful during the year, and no necessity arose for the intervention of the United States military forces in the administration of the government. The real feeling of the Cuban people toward the United States was very difficult to ascertain. It appeared probable, however, that the so-called Revolutionary party, which was on the whole in control of the constitutional convention and of the local governmental administration of the island desired as complete an independence as possible for the island, and viewed with some suspicion the motives of the United States. On the other hand, the property interests of Cuba seemed very little in sympathy with this party and were said to desire annexation to the United States. Politically, however, these interests were weak and unpopular. Spaniards, Americans, English, and Germans are much more influential in the commercial life of the island than Cubans; the former holding probably three-fourths of all taxable property in the form of direct ownership, of mortgages or of open accounts. But these foreigners are entitled to no voice in the political affairs

of the island and are looked upon with distrust by the majority of unpropertied or poor Cubans. On this account, it is said that it will be very difficult to maintain a stable and harmonious government in Cuba until the average material welfare of the masses is raised much above its present level.

Elections.—In accordance with the provisions of the constitution, and of the electoral law declared by the military government, an election was held in Cuba on December 31, 1901, for the election of presidential and senatorial electors, and for the election of members of the house of representatives, governors of the provinces, and members of the provincial councils. By the same law, an election was announced for February 24, 1902, at which time the electors chosen on December 31, 1901, should cast their ballots for president, vice-president, and senators. The two candidates for president at the election on December 31 were General Estrada Palma (see article PALMA, ESTRADA), and General Bartolome Maso. General Palma, who had been active in the insurrection of 1868 and for a time president of the provisional government established at that time, and who, moreover, was head of the so-called American Junta, in 1898, was supported by nearly all of the prominent military and political leaders of Cuba, including General Maximo Gomez, Señor Gonzales, and Señor Capote. General Maso, on the other hand, a negro and lieutenant-general in the former Cuban insurrection, was supported, as was alleged, by various desperate bodies of extremists, including negroes, Spaniards, and revolutionists. The candidacy of General Palma was supported by practically all of the property interests of the island, while that of General Maso was pushed by appeals to race prejudice and a campaign cry of complete independence from the United States. Allegations were brought forward by the Maso party to the effect that the election Board of Scrutiny was composed wholly of Palma advocates. While this was not denied by the Palma men, they asserted that no charges of irregularities in registration or election returns had been brought forward or could be proved. As a result of the election, Thomas Estrada Palma was elected president; that is to say, the electors who would cast votes for him were elected, and of the 63 members who would compose the house of representatives, 55 Palma men were chosen. The senate also, as a result of the elections, will support Palma by a large majority; all the senators elected in Matanzas, Havana, and Santa Clara being of his party. The civil governors elected in the several provinces were as follows: Perez, in the province of Pinar del Rio; Nunez, in Havana; Lecuona, in Matanzas; Gomez, in Santa Clara; Recio, in Puerto Principe; and Echeverria, in Santiago. The number of representatives in the legislature from each province, elected on the basis of population, is as follows: Havana, 17; Santa Clara, 14; Santiago de Cuba, 13; Matanzas, 8; Pinar del Rio, 7; Puerto Principe, 4.

Executive Officers.—The executive officers of Cuba in 1901, under the temporary government of the United States, were as follows: Military governor, Brig-Gen. Leonard Wood; secretary of state and government, Diego Tamayo y Figueredo; secretary of finance, Leopoldo Cancio; secretary of justice, José Varela y Jado; secretary of agriculture, commerce, and industries, Perfecto Lacoste; secretary of public instruction, Enrique José Varona; secretary of public works, José Ramón Villalón. See POLITICAL AND SOCIAL SCIENCE, AMERICAN ACADEMY OF.

CUMBERLAND PRESBYTERIAN CHURCH, a sect of Presbyterians strongest in the central, south central, and southwestern States, was independently organized in 1810. The church, which includes 16 synods and 122 presbyteries, now has 182,449 members, 1,589 ministers, 2,963 churches with property valued at \$4,267,561, and over 104,000 Sunday-school teachers and scholars. Contributions for all purposes in 1901 amounted to \$822,150, an increase of about \$150,000 over the aggregate of the previous year. The Cumberland Presbyterians have a publishing house in Nashville, Tenn., and are represented denominationally by the *Cumberland Presbyterian*. A dozen or more educational institutions are under the control of the church; its theological seminary is at Lebanon, Tenn. The home missions of the church, which are found in twelve States, and extend as far west as the Pacific coast, are directed with especial attention to the German and colored peoples. The foreign missions have occupied fields in China, Japan, and Mexico, and the work in the first-named country, which has suffered from the anti-foreign outbreak of 1900, is to be renewed with an increased force of missionaries. The seventy-first meeting of the General Assembly of the church, which was held May 16-23, 1901, at West Point, Miss., passed a constitutional amendment suggested in 1900 and afterward approved by a majority of the presbyteries, on the rotation of deacons and elders; it also adopted the report, as amended after discussion, of a special committee on the divorce question that the confession of faith "is to be understood as teaching that the courts cannot righteously dissolve marriage relations without duly following the teaching of God's word." In 1902 the assembly will convene at Springfield, Mo.

Cumberland Presbyterian Church (Colored).—This body, with 450 ministers, 400 churches, and a constituency of about 40,000, in affiliation as to polity and doctrine

with the Cumberland Presbyterian Church, was founded in 1869. The General assembly of the church held its annual session during the middle of May, 1901, in Pratt City, Ala.

CURACAO, a Dutch colony in the Caribbean Sea, north of Venezuela, consisting of a group of islands, the largest of which is Curaçao. The total area is 403 square miles, that of Curaçao being 210. The population January 1, 1899, was 51,524, of which Curaçao had 29,558, Aruba 9,349, Bonaire, 4,829, St. Martens 3,577, Saba 2,779, and St. Eustache 1,432. About five-sixths of the population is Catholic. The Jews number 831. The colony is administered by a governor, and a council composed of an attorney-general and three other members, all nominated by the crown. A colonial council, including the administrative council, and eight others, provides local government. A subordinate administrative agent is placed over each island except Curaçao. A militia is maintained, numbering (1899) 383, with a garrison force in Curaçao of 169. A ship of the Dutch navy is constantly stationed in the islands. The revenue, consisting of customs, land tax, excise dues, and some indirect taxes, amounted for 1899 to 661,000 guilders (guilder equals 40.2 cents); the expenditure was 669,000 guilders, the deficit being supplied by the Netherlands. The estimated revenue and expenditure for 1900 were 609,000 guilders and 686,000 guilders respectively. The chief products are maize, beans, pulse, cattle, salt, lime, and woods. The imports of the island of Curaçao for 1898 amounted to 1,960,070 guilders. Curaçao has no export tax; the exports for the other islands amounted to 284,954 guilders. The trade of the islands is not flourishing, partly on account of the unsettled conditions in neighboring South American countries. In 1898, 2,323 vessels visited the islands. The best harbor is in Curaçao.

CURLING. The game of curling suffered no diminution in popularity in 1901. The total clubs enrolled in the Royal Caledonian Association numbered 671. The eleventh international match for the Gordon medal, between rinks of the United States and Canada, was won at Montreal February 5, 1901, by the Canadians, by a majority of 34 shots. The two other principal Canadian contests, the Victoria Jubilee trophy and the governor-general's prize, were both won by the Ormston rink; while Montreal won the Montreal AAA shield. In the United States the Dalrymple medal, North vs. South, was won by the North, 94-66. The \$500 gold Mitchell medal and the fourteenth club championship were won by the Van Cortlandt (N. Y.) Curling Club. The Gordon medal and twenty-ninth rink championship were won by the same club. The Hamilton medal and interstate match between the State of New York and New Jersey, were won by New York by a majority of 28 shots, and the second match for the Dewar challenge cup and four gold medals for the winning rink was won by the rink of the Caledonian Club.

CURRENCY. See BANKS—BANKING (paragraph Currency Questions).

CYCLING. The year 1901 was marked by the disappearance of the International Cycling Association, an organization formed by a union of the French Cycling Society and the Amateur Athletic Union of America. The organization was of little value. The conduct of all racing, and the keeping distinct the classes of amateurs and professional riders was placed with the National Cycling Association, and this system has worked well. This left the League of American Wheelmen free to attend to its legitimate function of watching and aiding the interests of the ordinary rider, especially in the way of road improvement. Wherever good roads have been procured, interest in cycling has been more than maintained, and such runs as the Irvington-Milburn road-run have drawn large numbers of wheelmen. The most notable step towards good roads was taken by the National Good-Roads Association and by the Illinois Railroad Company. The latter, at a cost of some \$80,000, sent a train equipped with the best road-making machinery, together with engineers and expert mechanics, on tour through the south and middle west to give practical demonstration of the value of good roads by actually building, rebuilding, or repairing quarter-mile sections at various points selected over a wide area. The most notable professional cycling contest was that which terminated at the Madison Square Garden, New York, December 14, 1901. This was a six-day race, and was carried out in pairs, since the law does not permit one man to be on the track more than twelve hours in a day. The first five pairs each covered 2,555 miles and 4 laps. The first pair, R. Walthour, of Atlanta, Ga., and A. McEachern, of Toronto, Canada, beat Wilson and Maya by 2 yards, and they in turn beat Munro and Newkirk, Babcock and Turville, and Butler and McLean, by 5 yards.

CYPRUS, an island in the eastern Mediterranean, 60 miles from the coast of Asia Minor, is a British colony, although, under the convention of 1878, it pays an annual tribute to the sultan. The area is 3,584 square miles, and the population in 1901 numbered 237,022, of whom 21.64 per cent. were Mohammedans and the remainder mostly members of the Orthodox Greek Church. The capital is Nicosia, an inland town, with a population (1901) of 14,752. The government is to some

extent representative. It is vested in a high commissioner (Sir W. F. H. Smith since 1897), an executive council, and a legislative council, partly elective. The revenue amounted in 1901 to £215,268, which was considerably above the average, and has only twice been exceeded since the British occupation. The expenditure in 1901 was £135,387, of which the greater part was spent for police and public works. On the whole since the occupation there has been an excess of revenue over expenditure of over £1,300,000, which, however, has been more than offset by the annual tribute of £92,800 payable to the Porte. There was a new local silver coinage in 1900 to supersede the imperial coinage in use. The imports in 1900 were valued at £289,962, and the exports at £264,851. Wine is the most important manufacture of the island, the production in 1900 being 3,750,000 gallons, of which 1,528,169 gallons were exported. The wheat crop in 1900 was over 1,500,000 bushels, and the barley crop over 2,000,000 bushels. With the exception of three high-schools for Greek Christians, and one for Mohammedans, the schools are of an elementary character, most of them receiving government aid. The enrollment in 1900 was 19,080. The building of a railroad from Nicosia to the coast, and extensive irrigation and harbor improvements were undertaken during the year, an imperial loan of £314,000 being advanced for the purpose.

CZECHS. See AUSTRIA-HUNGARY (paragraphs on History).

DAHOMEY, a French colony in Africa, situated on the Gulf of Guinea, between Togoland on the west and Lagos on the east, was extended northward in 1900 by the addition of the territories of Say and Nebba, or Kwala. It now reaches to the French military territories. The area is estimated at 60,000 square miles; the additions comprise about 10,000 square miles. The population is roughly estimated at 1,000,000, and consists mainly of negroes. The country is within the jurisdiction of the governor-general of French West Africa, and the seat of the general government is St. Louis, in Senegal. Local affairs, however, are administered by a governor and administrative council in Dahomey, at Porto Novo, a town of 50,000 inhabitants. The prosperity of the colony has rapidly increased; the local budget of 1900 balanced at 2,200,000 francs; whereas in 1897 France expended 1,735,000 francs on this colony. (The franc equals 19.3 cents.) The natives of the coast region are good farmers, and raise corn, manioc, yams, and potatoes, but the chief exports are coconuts and palm oil. Foreign commerce is in a flourishing state. In 1899 it amounted to 25,000,000 francs; in 1900 to 28,000,000 francs. Most of the increase was on account of imports. The main articles imported were: Beverages (4,328,000 fr.); tobacco (1,058,363 fr.); textiles (3,299,739 fr.); salt (361,208 fr.); and machinery (308,000 fr.). In 1901 the customs receipts were greater than those in 1900 by about 319,00 fr. The imports in 1900 amounted to 13,950,000 fr.; the exports to 14,300,000 fr. The greatest portion of the imports came from France; imports from Germany were second in importance; those of Great Britain were comparatively small. The railway from Kotonu to the Niger, proposed in 1900, was begun in 1901. On May 22, 1901, the formation in Paris of a corporation to build another railway was announced. The company was to be called La Compagnie Française du Chemin de Fer du Dahomey, and was to be chartered for 75 years. It was to have general headquarters in Paris. The capital was fixed at 8,000,000 fr.

DAIRYING, that branch of agriculture which pertains to the management of cows and the production of milk, butter, and cheese, has made great advancements in recent years, and there was no abatement in this respect in 1901. Increased attention is being given to the milk supply of cities, and its source, with the result that in most cities there has already been a marked improvement in the conditions surrounding the production and handling of milk for domestic use. Cleanliness, as well as quality, is at last receiving attention in milk inspection. There is every reason why a rigid inspection should be maintained of the dairies and stables from which the milk supply of cities comes, for its neglect is far more dangerous to the health of consumers than is the sale of watered or skimmed milk. There is a much greater call for certified or sanitary milk, produced by healthy cows kept under good sanitary conditions, and properly handled and bottled so as to make it a safe food of uniform richness. Such milk is usually certified to contain a given percentage of fat. The production of it has become an established industry in the vicinity of most large cities, and an increasing number of people, appreciating the dangers of impure milk, especially to children and invalids, are willing to pay the slightly advanced price which it commands. The ordinary milk supply of most cities still leaves much to be desired in the way of cleanliness and healthfulness. The milk supplied to many creameries is now superior to the ordinary supply of cities—by reason of the supervision which they exercise. Realizing the necessity of pure, wholesome, fresh milk for making butter of uniformly high quality, they insist upon the observance of certain rules of cleanliness and precautions in handling the milk by the patrons supplying it; and the practice of paying for the milk by test, i.e., on

the basis of its fat content, has become almost universal. So important a matter has this test become, that a number of States have recently legislated upon it, providing for an official inspection of the bottles used in making it, to insure their being properly graduated. The Babcock test, which is the one universally used, is becoming a more important factor in dairying every year.

With a view to bettering the export trade in dairy products and affording to exporters the benefit of government certification as to the quality and purity of their products, the Department of Agriculture has inaugurated an inspection, which for the present is confined to creamery butter and whole-milk cheese, and is made at the option of the exporters. The government stamp will be placed only on products which are pure and of such quality as to be a credit to the dairy trade, the purpose being to improve the reputation of American dairy products in foreign markets.

The most noteworthy investigations in dairy lines recently have been on the processes of cheese ripening. The rationale of these—the part played by the natural ferment in milk, galactase, and by the rennet which is added in the process of making and which has lately been found to have an important part in the subsequent ripening—have been worked out in the laboratory and in experiments on a practical scale; and it has been shown that these processes can all be carried on much more safely in curing-rooms kept at a low temperature, 50° or 55° F. At this low temperature the losses which result from the growth of injurious organisms are avoided, and the process of ripening, while requiring longer, is under the control of the cheese maker. Moreover, the flavor of the cheese is not impaired, as was formerly believed to be the case when a low temperature was used. The success of the discovery has suggested the establishment of control or cooperative curing-rooms at convenient shipping points, where the cheese factories of the section adjacent might send their green cheeses for curing. The plan is entirely practicable and would relieve small factories of the expense of maintaining the proper curing-rooms, and of the care of their product during the critical stage which has so much to do with determining its quality.

In butter making the use of pasteurized milk or cream, which is so common in Denmark, and of pure cultures for ripening the cream, has not come into general practice in this country, although it has been tried on a small scale in many places. It has, however, served to call attention to a very important step in butter making and led to much greater care in the preparation and use of the starter for cream ripening than was formerly the case, with the result that the average quality of the product has been improved.

Lindsey has published the result of six years' work on the effect of food on the quality of milk and butter, again confirming the conclusion that rich (protein) feeding does not have any permanent effect on the composition of the milk, but showing that the flavor, hardness, body, melting point, and other qualities of butter are influenced considerably by different kinds of feed, irrespective of their actual composition. A similar result has been reached by Hills in his extensive experiments in Vermont.

An extensive test of breeds of dairy cows was carried on at the Pan-American Exposition the past season. It included ten of the common breeds, with five representatives of each breed specially selected for the purpose, and lasted six months. In net profit on the butter fat produced, the Guernseys led, followed by the Jerseys, Ayrshires, Holsteins, Red Polled, Brown Swiss, French Canadian, Shorthorn, Polled Jerseys, and Dutch Belted, in the order named. In net profit on total solids (corresponding to the estimated cheese-making value of the milk), the Holsteins led, with the Ayrshires second. The Holsteins "made a great record and as milkers far surpassed any other breed." The Ayrshires made an excellent showing. One of the chief results of the test was in showing the impossibility of settling the merits of breeds by a breed test; the result all depends on the cows selected to represent the several breeds, and the skill and judgment with which they are handled, and in the end they are not convincing and are of very little permanent value.

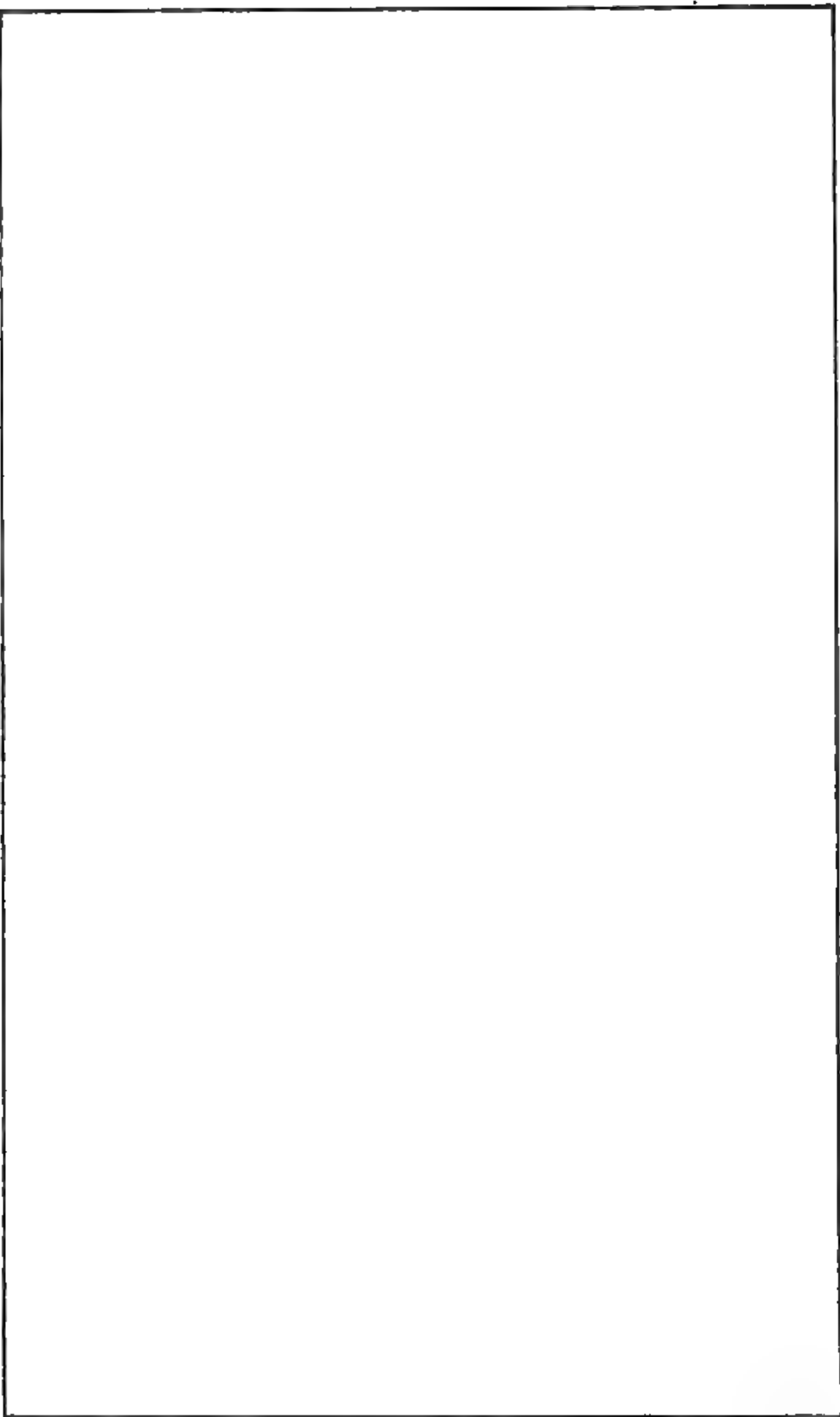
Much more attention is being given to the quality of cows kept on dairy farms, and a material improvement in their milking qualities is constantly going on. It is stated as probable that the average cow throughout the country is not paying her board. It has been shown so often in tests of herds that one-half or more of the cows were not profitable, that this, coupled with the returns from the creamery, has led to systematic selection and breeding up of the herds by thoughtful farmers all over the country. The experiment stations have shown, furthermore, that the poor returns are often due to inadequate feeding and poor management. This, taken in connection with the high prices of commercial feeds, has led to more intensive methods in dairy farming, under which a larger proportion of the grain and other concentrated feeds are being produced on the farm. Indeed, in the East and in the neighborhood of cities where the value of land is high, the practice is becoming increasingly extensive of growing soiling crops, largely of legumes, for feeding dairy

cows, which are kept up instead of being turned out to pasture. In a number of States the experiment stations have worked out practical rotations of these green crops, which furnish a continuous supply of feed of unusual richness throughout the growing season. This system of soiling greatly reduces the area required for keeping a cow, and likewise the amount of feed which has to be purchased. The tendency toward it and toward better feeding and care in general, together with the improvement of the average cow, are among the most marked tendencies in good dairy practice.

DALY, WILLIAM HUDSON, American army surgeon, died by suicide, at Pittsburg, Pa., June 9, 1901. He was born near Blairsville, Pa., July 11, 1842, and was educated at Jefferson Medical College, Philadelphia, and at the medical department of the University of Michigan. Dr. Daly served through the Civil War as a surgeon in the Union army, and on the termination of his service settled in Pittsburg. At the outbreak of the Spanish-American War in 1898, he became surgeon, with rank of major, on the staff of General Miles, and in the autumn of 1898 made a report on the beef furnished to the American troops which led to the famous "embalmed" beef inquiry.

DAMS. The use of steel for engineering structures has been extended to include dams. Usually the steel is limited to thin plates, riveted together to form a continuous sheet, and placed in the midst of a mass of loose stone in the rock-fill type of dam. But in two instances steel plates alone, supported by steel trestles or framework, have been employed. In the Ash Fork dam, built in Arizona for the Atchison, Topeka, and Santa Fé Railway Company a few years ago, the steel plates extended the whole depth of the structure. In a dam built by two mining companies in 1900-01 across the Salmon Trout River, at Redridge, Mich., to furnish water to stamp mills, the lower part of the dam is of concrete and the upper of steel. The combined steel and concrete section is 464 feet in length, but this is flanked by concrete abutments, and beyond these earth embankments with concrete core walls, extend some distance in each direction, making a dam with a total length of 1,006 feet. The greatest height of the dam is about 74 feet, which is about equally divided on the up-stream side between the concrete base and the steel-plate superstructure. The concrete base is 54 feet thick, measured along the bed of the stream. The depth of the concrete is much greater on the up-stream than on the down-stream side, and has the same slope, on the water face, as the steel plates. The steel plates have a slope or batter of 8 feet horizontal to 12 feet vertical measurement, and extend downward over the sloping portion of the concrete. The A-shaped frames that support the main part of the plates rest on and are anchored into the concrete base. The plates are $3\frac{1}{8}$ inch thick where supported by the framework and half that thickness where they are backed by the concrete. They are covered with a protective coating and have riveted joints. The dam diminishes in height each way from the centre and is comparatively low at the abutments. The plate covering of this dam, like that at Ash Fork, Arizona, was designed by F. H. Bainbridge. The reservoir formed by the dam has an available storage capacity of 600,000,000 gallons, and the water required by the stamp mills is about 25,000,000 gallons a day. The water will not flow over the crest of the dam, but will be directed to one side through a channel and over a spillway. A fully illustrated description of this unique structure is given in *Engineering News* for August 15, 1901. In the issue of January 2, 1902, of the same journal, a rock-fill dam is described which has a steel core plate to a height of about 60 feet, above which the sloping rock-fill is faced, on the up-stream side, with a continuation of the same plate. The total height of this dam above the bed of the stream is 93 feet, but a thin concrete wall beneath and surrounding the lower part of the plate extends to rock, some 35 feet lower. The original dam, completed in April, 1899, was 68 feet high, but it was extended as described in 1901. As it now stands, the reservoir formed by the dam has an available capacity of 387,500,000 cubic feet—enough water to cover 8,900 acres to the depth of one foot. So favorable is the natural site for the dam that the structure is only 173 feet long at the top. The dam was built to develop a water supply for irrigation. It is located on East Canyon Creek, near Ogden, Utah, and is owned by farmers in the vicinity, who are organized as the Davis and Weber Counties Canal Company. Mr. W. M. Bostaph is the chief engineer of the company and was the engineer for the dam. In December, 1901, the company contemplated raising the structure to the height of 156 feet, which would increase the available capacity to about 1,000,000,000 cubic feet.

DANISH WEST INDIES, three islands of the Virgin group belonging to Denmark, lying to the eastward of Porto Rico, have a combined area of 138 square miles and a population estimated at slightly over 35,000. St. Croix, the largest, has an area of 84 square miles and a population of 19,783. St. Thomas, area 33 square miles, population 14,389; and St. John, area 21 square miles, population 984. The seat of government is at Christianstadt, in the island of St. Croix, where a



DANISH WEST INDIES.—A Group of Natives (Upper). A Public Place in St Thomas (Lower).

governor-general appointed by the Danish crown resides. Charlotte Amalie, on St. Thomas, is the only other city of importance. The inhabitants are largely negroes speaking a Spanish dialect. English is spoken to a considerable extent in the ports. The Danish population, which is very small, consists almost entirely of officials and their families. The colony has almost complete self-government, the legislative power being vested in two colonial councils, one for each of the two districts into which the colony is divided, three-fourths of whose members are elected, and whose powers are limited only by those of the royal governor, who acts chiefly in an executive capacity. The budget is controlled entirely by the councils. Two-thirds of the colonial revenue is derived from indirect taxes, largely import duties. The direct taxes have for years amounted to little because of the impoverished condition of the people. The tariff rate varies, averaging only 3 per cent. ad valorem in St. John and St. Thomas, and amounting to a high protective duty in St. Croix, where the competition of the United States is supposed to injure the agricultural industries. An export duty of 5 per cent. exists on sugar. Since 1870 the revenue has been insufficient to meet the expenditure, and for the past decade the annual deficit has fluctuated between \$100,000 and \$150,000, which has been covered by advances from the Danish government, amounting in 1901 to a total of over \$2,000,000. The budget figures for the fiscal year 1900-01 were, revenue, \$250,385, and expenditure, \$432,901, leaving a deficit of \$182,516. Sugar, which was formerly the staple product of the islands, is still exported to some extent, although the production is but a small fraction of what it once was. Rum and molasses are also manufactured for export. The trade is largely with the United States, which furnishes three-fifths of the imports (\$478,462 in 1901) and takes four-fifths of the exports (\$692,150 in 1901). The commerce of the islands with Denmark has been steadily falling off for years, the imports from the mother country having decreased from \$425,000 in 1883 to \$20,300 in 1899, and the exports to Denmark from \$98,000 in 1883 to \$25,000 in 1899.

Particular interest attaches to the islands from the fact that negotiations which have been in progress for two years past appeared at the close of 1901 to have resulted in an agreement on the part of Denmark to sell the islands to the United States for a sum approximating \$5,000,000. The first attempt on the part of the United States to purchase the islands was made in Lincoln's administration, when, in January, 1865, Secretary Seward made an informal offer of purchase to the Danish government. Negotiations followed, resulting in the signing of a treaty in October, 1867, by the terms of which this country was to pay \$7,500,000 for the two islands of St. Thomas and St. John. This treaty, although ratified by the Danish *Rigsdag*, was rejected by the United States Senate. Not until 1892 were negotiations again opened. They amounted to nothing at that time, but two years ago were begun for a third time. Several times during 1901 it was announced that negotiations had been broken off. A movement was started in the islands in opposition to the sale, and an elaborate scheme for promoting the islands' industries and diverting trade from American to Danish channels was reported to have been decided upon by a syndicate of Copenhagen merchants. A change in the Danish ministry delayed matters, but the evident desire of the government to be rid of a colony which had proved only a drain on the treasury of the home government finally overcame sentiment.

DARTMOUTH COLLEGE, Hanover, N. H., founded 1769, includes, besides the college proper, the Amos Tuck School of Administration and Finance, the Thayer School of Civil Engineering, and the Medical School. In 1901 the faculty numbered 71 professors and instructors, and the student body 686, of whom 23 were graduates and 663 undergraduates. The college offers three parallel courses, the classical, the Latin-scientific, and the scientific. By a gift of \$100,000 from Mr. Edward Tuck, provision has been made for the erection and maintenance of a building for the School of Administration and Finance, which is expected to be ready for occupancy in September, 1902. The library contains about 85,000 volumes and 20,000 pamphlets. During the last year a building was erected by the trustees for the social uses of the college, which will provide for 300 students.

DAUGHTERS OF THE KING, an order of religious service in the Protestant Episcopal Church, founded in 1885, has 734 chapters and 15,673 members, and in the Junior Branch 345 members in the 31 chapters. The order, found throughout the various dioceses of the church in the United States, extends also to Canada and England. At the convention held in San Francisco, October 5-8, a resolution was passed making subsequent conventions triennial instead of annual. The official organ is *The Royal Cross*. President, Mrs. E. A. Bradley; secretary, Miss Elizabeth L. Ryerson, 281 Fourth Avenue, New York City.

DAVIN, NICHOLAS FLOOD, Canadian M.P. and journalist, died by suicide at Winnipeg, Manitoba, October 17, 1901. He was born at Kilfinane, Ireland, January 13, 1843, and was educated at Queen's College, Cork. In 1868 he was called

to the London bar, but after practicing a short time he entered journalism and went to Canada in 1872, where he joined the staff of the *Toronto Globe*. After a short experience in this position he lectured for a year, then joined the staff of the *Toronto Mail*, leaving in 1874 to begin the practice of law. He went to the Northwest Territory in 1882, and in the following year established the *Leader*, the first newspaper to be published in Assiniboia. Upon the granting of representation to the Territories in 1887, Mr. Davin was elected to the House of Commons from West Assiniboia, a seat he held at the time of his death.

DAWSON, GEORGE MERCER, F.R.S., director of the Geological Survey of Canada, died March 2, 1901. He was born at Pictou, Nova Scotia, August 1, 1849, the son of Sir William Dawson, also a famous geologist and principal of McGill College, Montreal. The younger Dawson was educated at McGill College and the Royal School of Mines in London, receiving at the latter institution a thorough scientific training at the hands of such professors as Ramsay, Huxley, Etheridge, Frankland, and Percy. On his return to Canada he was occupied with mine surveying and educational work until 1873, when he was appointed geologist and botanist to the British North American Boundary Commission, then engaged in the location of the boundary between Canada and the United States. On this expedition he accumulated much scientific material, and in 1875 published a *Report of the Geology and Resources of the Country in the Vicinity of the 49th Parallel*, and prepared other reports and memoirs dealing with various geological and zoological conditions of this region. In 1875 he was appointed to the Dominion Geological Survey, and became its director in 1883. He was a thorough explorer and made many trips through British Columbia and the Northwest Territories, examining the mineral deposits and locating the prominent features of the country. So thorough was Dr. Dawson's acquaintance with the geography and resources of Canada that he was chosen as a British commissioner at the time of the Bering Sea arbitration, and prepared a report dealing with the conditions of seal life from actual observations made during the summer of 1892. The report and Dr. Dawson's arguments were considered an important feature of the British case, and he was rewarded by being made a companion of the Order of St. Michael and St. George. His academic and scientific honors were even more marked. He held the degrees of D.Sc. from Princeton and LL.D. from Queen's University and McGill University. In 1891 he was made a Fellow of the Royal Society and received the Bigsby medal of the Geological Society of London. His high scientific attainments led to his election as president of the Royal Society of Canada, and when the British Association for the Advancement of Science held its meeting at Toronto in 1896, he was president of the Geological Section. In 1900 Dr. Dawson was president of the Geological Society of America, an organization of the geologists of the United States and Canada. He was the author of many valuable reports and papers, published not only by the Dominion government, but by various learned societies of America and England. His successor as director of the Canadian Geological Survey is Dr. Robert Bell (*q.v.*).

DEATH-RATE. See VITAL STATISTICS.

DELAWARE, an eastern State of the United States, has an area of 2,050 square miles. The capital is Dover. Delaware was one of the original thirteen States. The population in 1900 was 184,735, while in June, 1901, as estimated by the government actuary, it was 187,000. The populations of the two largest cities in 1900 were: Wilmington, 76,508, and Newcastle, 3,380.

Industries.—Although Delaware is an agricultural State, the census reports of 1900 show a steady increase in manufacturing interests since 1850. During this time the population increased from 91,532 to 184,735, or more than 100 per cent., while the average number of industrial wage-earners increased from 3,888 to 22,203, this latter number representing 12 per cent. of the total population. The amount of actual capital invested in 1900 in mechanical industries, exclusive of capital stock, was \$41,292,267; the gross value of the products was \$45,437,490, while the net value, exclusive of products re-used in the process of manufacture, was \$29,573,449.

The industries of Delaware depend largely upon two factors: Its geographical position and its extensive orchards. Numerous railways bring the coal and iron fields of Pennsylvania within easy reach and render the markets of Philadelphia and Baltimore accessible to the completed products, while good harbors at Wilmington, Newcastle, and Lewes, and the navigability of the Delaware River and Delaware Bay encourage coastwise and export trade. The abundance and excellence of the fruit grown have resulted in a striking development of the fruit canning and preserving industry, the value of the product of which has more than doubled in the last decade.

The principal manufacturing industries of the State are those in which iron, steel, or their products are the chief materials. These industries embrace steel and

rolling mills, car shops, foundry and machine shops, and shipbuilding plants. In 1900 the product of these was valued at \$13,953,379, being 30.7 per cent. of the total value of the products of the State. The next industry in importance is the tanning, currying, and finishing of leather, with a product in 1900 valued at \$9,400,504, more than double the value of 1890. The most remarkable development has been shown in the canning and preserving industry. In 1900 the product was valued at \$1,570,790, an advance of 112.2 per cent. in the decade. Other manufactures of importance are fertilizers, valued at \$738,703, a decrease of 28 per cent. since 1890, and cotton and woollen goods valued at \$920,828, a decrease of over 40 per cent. since 1890. The decline of the latter industry, founded early in the century, is worthy of note.

Agriculture.—Delaware is preeminently a fruit-growing State. Improved farm lands occupy 60.8 per cent. of its entire area, a larger proportion than in any other State on the Atlantic coast. Indeed, only four States in the country, all in the North Central group, have a proportion of improved land in farms greater than that of Delaware. It seems to be the natural home of the peach, while apples and small fruits, as strawberries, raspberries, etc., are also raised in abundance. Delaware, New Jersey, and Maryland supply about seven-tenths of the demand for these products in the New York and Philadelphia markets.

Legislation.—The session of the Delaware legislature which met in January, 1901, was principally occupied in endeavoring to elect two United States senators. (See paragraph Senatorial Conflict.) This attempt failed, however, and the legislature adjourned on March 8. The original intention had been to adjourn on March 1, but the time was delayed until after the expiration of Senator Kenny's term on March 4, in order that under the decision of the Senate in the Quay case in 1900, a vacancy should not happen during the recess of the legislature and make it possible for the governor to appoint a senator. Of the few acts passed by the Delaware legislature in the intervals of the senatorial conflict, one of the most interesting was the ratification on February 12, 1901, of the Thirteenth, Fourteenth, and Fifteenth amendments of the Constitution of the United States. Although Delaware was the first State to ratify the national constitution, it was the last to ratify these amendments, and prior to this act colored people had to make affidavits to the justice of the peace that they were free before they were allowed to marry. Notwithstanding that Delaware could not elect a senator, a resolution favoring the election of senators of the United States by a direct vote of the people was rejected by it. A ballot law was passed, in curiously exact antithesis to a ballot law enacted by Maryland in the same year. (See article MARYLAND, paragraph Ballot Law.) The Delaware law created the office of "voters' assistants," and provided that two assistants, one to be appointed by each party in each precinct, might assist voters to mark or change their ballots or to fold them or read to the voter the names of the candidates on the ballot. Other acts of the Delaware legislature were as follows: An act making kidnapping punishable by death or imprisonment for life, at the discretion of the court; an act creating a State library commission for the State of Delaware, to have general control and supervision of all free and circulating and traveling libraries in the State, and authorizing the establishment of a free library in any city or town upon the affirmative vote of the electors; an act prescribing that all oleomargarine made in imitation or semblance of pure butter should be plainly labeled "oleomargarine," "butterine," or whatever it might actually be; an act amending the general corporation act of 1899; an act appropriating \$12,000 for the erection of proper school buildings for the colored people, as the existing schools were asserted to be in an unfit and unsanitary condition, and the colored people had not the means to improve them; an act receiving commendation from many quarters, and especially indorsed by justices having jurisdiction over that class of cases, provided that wife-beaters should in the discretion of the court be not only fined and imprisoned, but should also be whipped to the extent of not more than 30 lashes and not less than 5.

Corporation Laws.—An act was passed providing for the taxation of the franchises of all telegraph, telephone, express, sleeping-car, and palace-car companies, pipe-line and gas companies, and insurance companies organized under the laws of the State. The tax was to vary in amount with the different forms of companies, and was to be a per cent. of the gross receipts of the company from business done in the State, or else a certain per cent. of the dividends, or both. And if any corporation did not pay its tax, an injunction might be obtained by the State to prevent the company from exercising its franchise, or to vacate the franchise if the company still persisted in refusing to pay taxes. A constitutional amendment was proposed to the effect that in the constitution adopted in 1897 that clause should be struck out which provided that in all elections for directors of corporations, each share of stock should be entitled to one vote, and that that clause also should be struck out which provided that stock should only be issued for money or adequate property. It was further proposed that there should be inserted in the constitution

the clause that "shares of the capital stock of corporations created under the laws of this State, when owned by persons not residing therein, shall not be subject to taxation by any law now existing or hereafter enacted."

Delaware-New Jersey Boundary Question.—At the suggestion of Governor Hunn, the Delaware legislature instructed the attorney-general to take necessary legal steps to protect the rights of the State in the boundary dispute with New Jersey. The contention between the two States in this matter grew out of the arrest of some Delaware fishermen who were fishing along the New Jersey shore opposite New Castle in 1871. Delaware claimed sovereignty over the Delaware River to the low-water mark on the New Jersey shore opposite New Castle, and distant from the court house in New Castle not more than 12 miles. New Jersey, on the other hand, claims jurisdiction of all the river east of an imaginary line drawn down the centre of the stream. The litigation is now on the calendar of the United States Supreme Court.

Senatorial Conflict.—The main interest of the session of the Delaware legislature, which met on January 1, 1901, and adjourned on March 8, was centred in the attempt of Mr. J. Edward Addicks to have himself elected to the United States Senate. This senatorial ambition of Mr. Addicks dates apparently from 1889, when he became a citizen of Delaware. At that time the legislature was Republican for the first time since the Civil War, and Mr. Higgins (Rep.) was elected to the Senate. From that year on Mr. Addicks displayed great energy in developing the Republican strength of the State; he worked especially in counties that had previously been heavily Democratic, and by devoting himself somewhat exclusively to these counties built up a political machine for himself independent of that of the regular State Republican organization, which thereupon became antagonistic to him. In 1893, when another senator was to be elected, the State legislature was Democratic, and Mr. George Gray (Dem.) was elected to the Senate. In 1895, however, the State was again Republican and Mr. Addicks demanded that he should represent Delaware at Washington. Through his personal following in the legislature, Mr. Addicks held the balance of power between the Democrats and the regular Republicans, and as neither party was strong enough to elect a senator without Mr. Addicks, and as Mr. Addicks' sole campaign platform was "Addicks or nobody," the senatorial vacancy was not filled until 1897, when the legislature was again Democratic and Mr. Kenney (Dem.) was elected for the remainder of the term ending March 4, 1901. In 1899 the State again gravitated to the Republicans and the expiration of the term of Mr. George Gray left a senatorial vacancy to be filled. But again the cry was raised of "Addicks or nobody," and for the second time the Republican majority was unable to agree upon a candidate. In the meantime Mr. Addicks had carried his case, in 1896, before the Republican national convention at St. Louis. Two sets of State delegates went to this convention, one representing Mr. Addicks and the other the regular organization, headed by Mr. Du Pont and Senator Higgins. The Du Pont-Higgins delegates were seated at this time, thus throwing the weight of the Republican party against Mr. Addicks. But Mr. Addicks, still persevering, carried the same question before the national convention of 1900 in Philadelphia, and this time the convention proposed to seat representatives of both sets of delegates. When the Du Pont men refused to accede to this, the Addicks men were seated. In the legislature elected in November of that year, the Republicans had 29 votes on a joint ballot, 9 in the senate and 20 in the house, while the Democrats had a joint ballot of only 23, 8 in the senate and 15 in the house. This legislature had to elect not one senator, but two; for there was one vacancy extending from 1899, and the term of Mr. Kenney also would expire on March 4, 1901. The Addicks men endeavored to compromise matters with their opponents in the legislature, and especially with seven Republicans who were united in their utter opposition to Mr. Addicks, and offered to permit any man representing the regular, or Du Pont Republicans, to be elected for the short term of the Senate expiring in 1905 if the Du Pont delegates would turn around and elect Mr. Addicks senator for the long term expiring in March, 1907. It was understood also that this view of the case was indorsed by the Republican national committee, and Senator Marcus A. Hanna, as its chairman, was reported as saying that Mr. Addicks, by making Delaware at least a doubtful, if not a regular, Republican State, was fully entitled to the senatorship. On February 8, however, the Du Pont Republicans finally declined any proposition looking to the election of Mr. Addicks, and from that time on futile ballots were taken daily until the legislature adjourned on March 8. It had been the original intention of the legislature to adjourn on March 1, but it was known that the governor, Mr. John Hunn, was favorable to Mr. Addicks, and under the ruling of the Senate in the Quay case in 1900 to the effect that a governor could not appoint a senator if a vacancy "happened" while the legislature was in session, it was deemed wise not to adjourn until after Senator Kenney's term had expired on March 4. Even then the sudden adjournment

of the legislature *sine die* on motion of the Du Pont Republicans came as a most unwelcome shock of surprise to the Addicks delegates, who had persisted in believing that some compromise would be finally effected if they would but have patience. Never before in the history of the country had a State been left totally unrepresented in the Senate through the inability of its legislators to agree upon a candidate. And this fact, when taken in conjunction with the long deadlocks in Nebraska (*q.v.*) and the more reprehensible swiftness of election, as was alleged, in the Pennsylvania (*q.v.*) legislature, strengthened the popular demand in the United States that senators should be elected by direct votes of the people and that a constitutional amendment should be passed to that effect. (See UNITED STATES, paragraph Election of Senators.) As to the merits of the Addicks matter, it was pretty generally alleged that Mr. Addicks had spent money without stint for six years solely to get himself elected, and that his election would have been a national disgrace. On the other hand, it was pointed out that Mr. Addicks had had much less ability to do actual harm, owing to the relative unimportance of Delaware's industrial resources, than some senators regularly elected from other States, and that in fact Mr. Addicks had done comparatively little harm, and that his turning the State from giving a regular Democratic majority to giving a regular Republican majority merited recognition.

State Officers.—Governor, John Hunn, Republican, elected for four years, term expires in January, 1905; lieutenant-governor, Philip L. Cannon; auditor, Purnal B. Norman, Jr.; treasurer, Martin B. Burris; attorney-general, Herbert H. Ward; commissioner of insurance, George W. Marshall.

Supreme Court: Chancellor, John R. Nicholson, Dem., term twelve years, expires June, 1909; chief justice, Charles B. Lore, Dem., term twelve years, expires June, 1909; associate justices, Ignatius C. Grubb, Dem., W. C. Spruance, Rep., James Pennewill, Rep., and William H. Boyce, Dem.

Congressional Representatives (57th Congress).—In the House: L. H. Ball, Republican, from Faulkland. In the Senate: Terms for both senators have expired, that of Richard Rolland Kenney in 1901 and that of George Gray in 1899, and no senators have been elected to their place.

DENMARK, a constitutional monarchy of Europe lying to the north of Germany. The capital is Copenhagen.

Area and Population.—The total area of Denmark, which embraces the peninsula of Jutland, certain islands in the Baltic, and the Faroe Islands, is 15,289 square miles. On February 1, 1889, the population, exclusive of the Faroe Islands, which had 12,955 inhabitants, was 2,172,380. According to the census of February 1, 1901, the population showed an increase of 275,061, the total being 2,447,441. Accordingly, the average annual increase during the decade was 1.09 per cent. As the population in 1801 was 929,001, the increase during the century was 163 per cent. The last census showed a rural population of 1,474,501, as against 1,416,213 in 1890, and an urban population of 972,940, as against 756,167; the former, therefore, showed an increase of 4.1 per cent. and the latter 28.7 per cent. In 1890 Copenhagen had 321,418 inhabitants, while in 1901 the population of the same territory was 378,280, a gain of 17.7 per cent.; meanwhile, however, certain districts were annexed to the city, so that in 1901 its total population was 389,131, while its suburbs had 102,209 inhabitants additional.

Emigration, which is chiefly to the United States, is small, the number of emigrants in 1899 being 2,799. Religious toleration prevails, though Lutheranism is the state religion. Elementary instruction is free and compulsory; there are about 3,000 elementary schools, with about 310,000 pupils in attendance.

Government.—The executive authority is vested in the king, who is assisted by a ministry of eight members, appointed by him and responsible to the lower house of parliament. This body, the *Rigsdag*, is bicameral, consisting of the *Landsting*, or upper house, and the *Folkething*, or lower house. A part of the members of the former are appointed by the crown and a part are chosen by certain electoral bodies; members of the latter are elected by popular vote. The reigning sovereign is Christian IX., of the house of Schleswig-Holstein-Sonderburg-Glücksburg, who ascended the throne in November, 1863. The heir apparent is his son, Prince Frederick, who was born in 1843. On July 17, 1901, the Conservative ministry of M. Hannibal de Sehested, who was appointed premier on April 27, 1900, resigned, and on the 23d of the month Professor J. U. Deuntzer formed a new ministry, of which all the members represented the Left. See the paragraphs on History.

Army and Navy.—All able-bodied men on reaching the age of 22 years are liable to service in the regular army. This force in 1900 numbered 824 officers and 8,945 men; the war strength is about 1,450 officers and 60,000 men. The navy comprises 5 coast defense armorclads, 6 third-class cruisers, 7 gunboats, 34 torpedo boats, a turret ship, a barbette ship, and 2 torpedo ships. The *Herluf Trolle*, an armored ship of 3,470 tons and a speed of nearly 16 knots, was launched in 1899, and a sister

ship is now building. A third-class battleship of 5,000 tons was laid down in 1901.

Finance.—The monetary standard is gold, and the unit of value the krone, worth 26.8 cents. The revenue and expenditure in kroner for fiscal years ending March 31 have been: 1899, 71,193,060 and 76,259,212 respectively; 1900, 72,561,487 and 77,509,052 respectively. The estimated revenue for the fiscal year 1901 was 72,820,278 kroner and the estimated expenditure 71,464,566 kroner; similar figures for 1902 are 73,662,225 kroner and 72,673,602 kroner respectively. The largest items of revenue in the latter budget are indirect taxes (mainly customs and excise), 51,117,400 kroner, and direct taxes, 10,816,700 kroner, while the largest items of expenditure are for the army, 10,947,694 kroner; the navy, 7,867,305 kroner; charges on the debt, 7,170,500 kroner; for the ministry of public worship and instruction, 7,511,587 kroner; the interior, 7,189,448 kroner, and for extraordinary state expenses, 11,100,172 kroner. The estimated revenue and expenditure for the fiscal year 1903 are 72,900,000 kroner and 72,400,000 kroner respectively. On March 31, 1900, the total public debt amounted to 207,419,912 kroner, of which 138,512,250 kroner were owed abroad. A year later the total debt had increased by about 10,000,000 kroner.

Industries and Commerce.—Nearly one-half of the inhabitants live by agriculture and one-fourth by commerce and manufactures. The principal crops are beets, oats, barley, rye, potatoes, and wheat. The estimated value of the grain and hay crops in 1899 was about 318,000,000 kroner, some 10,000,000 kroner less than in the preceding year. Crop values in 1900 somewhat appreciated, but less activity was noted in manufacture. The general imports and exports in 1899 (exclusive of the precious metals) amounted to 492,079,000 kroner and 364,521,000 kroner respectively, as against 462,219,000 kroner and 326,361,000 kroner in 1898. In the special trade the imports in 1899 were valued at 399,800,000 kroner and the exports 270,129,000 kroner. The values of the leading imports in 1899 were, in kroner: Cereals, 73,509,000; textile manufactures, 55,221,000; metals and hardware, 47,224,000; coal, 35,346,000; wood and wood manufactures, 47,224,000. Similar figures for the most important exports of home produce were: Pork, butter, eggs, and lard, 190,103,000; animals, 19,445,000; cereals, 9,148,000; metals and hardware, 3,405,000; the export of fish and fish products amounted to 8,314,000 kroner. The leading countries in the import trade in 1899 were: Germany, 144,253,000 kroner; Great Britain, 100,519,000 kroner; the United States, 78,146,000 kroner, and Norway and Sweden, 59,117,000 kroner. The most important countries receiving Danish exports were: Great Britain, 216,415,000 kroner; Germany, 66,673,000 kroner; Norway and Sweden, 46,121,000 kroner; Russia, 16,209,000, and the United States, 6,852,000 kroner.

Communications.—In 1900 the Danish railways had an aggregate length of 1,711 miles, of which 1,108 miles belonged to the state. The total cost of the state railways up to March 31, 1900, was 237,025,353 kroner. At the beginning of that year the state telegraphs aggregated 3,068 miles of line, with 9,367 miles of wire and 170 offices. The railway and private telegraph offices numbered 304. There are over 850 post-offices.

HISTORY.

Under European constitutional government it is customary for the crown, upon the resignation of a ministry failing to receive the support of the lower parliamentary house, to select a new ministry from the party having a majority in that body. This method, however, was not recognized in Denmark until 1901. Excepting a ministry in 1859, which lasted only a few weeks, the Danish ministries have always represented the Right, that is, the conservative political elements, although upon the revision of the constitution in 1866 the electorate began to favor the Left, and as long ago as 1872 the Liberals secured a majority of 27 in the *Folkething*, or lower chamber. The king insisted upon Conservative ministries, not only because he favored the Conservative party himself, but because he did not wish to admit the principle that a ministry should represent a parliamentary majority. The *Lands-thing*, or upper chamber, has always been Conservative. Consequently, for many years there has been friction between the administration and the *Landsting* on the one hand and the *Folkething* on the other. The conflict was carried on in various ways, a not infrequent method of the *Folkething* being its refusal to vote the budget. But notwithstanding the long and increasing spirit of disagreement between the administration and the popular legislature, the king never lost the good will of the people. The friction culminated in 1900 and 1901, and finally brought about what was heralded as a new era for Denmark. The principal events leading up to this change were as follows.

At the end of 1900 there was much confusion in the *Rigsdag* over the question of tax reform. In the preceding September a parliamentary commission had presented a reform programme which the *Folkething* adopted, but which, to the disappointment even of many Conservatives in the *Landsting*, the ministry refused to accept. The government brought forward tax proposals of its own, and on

December 5, 1900, another commission was appointed (by the *Landsting*) to consider the taxation question. The government had against it a large majority in the *Folkething*, and it could hardly count on a faithful majority in the *Landsting*; but this majority, though not very considerable, was skillful. For the report of the *Landsting* commission, while differing considerably from the plans adopted by the *Folkething*, also differed from the government's ideas, but in the main expressed the latter. Thus the government was enabled to side with the majority in the *Landsting*. This majority, moreover, was not reactionary; the proposals of the commission in a certain measure were even radical, demanding the abrogation of the heavy and unjust taxes on landed property in favor of taxes based on actual values. From the point of view of politics the proposals of the *Landsting* were cleverer than those of the *Folkething*. In particular the abolition of certain taxes and the introduction of new ones were preferable to the *Folkething* plan, which recommended the transfer from the state to the communes of certain taxes, whose actual assessment, however, should be as before. The proposals of the *Landsting* were also favorable to agrarian interests, which were dominant in both chambers; for members of the *Folkething* are chosen largely by the farming classes, while the *Landsting* wishes to retain the influence of the great landed proprietors. Thus the proposals of the *Landsting* seriously embarrassed the leaders of the Left, who had expected reactionary plans and found instead liberal measures which made greater concessions to agricultural interests than those proposed by themselves. The *Folkething* accordingly adopted the essential proposals of the commission. But agreement, at least superficial, which was so nearly reached, failed of final accomplishment; for a new commission, appointed in the middle of March (1901), and composed of 15 members from each chamber, came to no decision, and on the 31st of the month the parliamentary session closed after long and apparently fruitless debates.

It was not fiscal questions alone that had taken parliamentary attention or provoked friction in the *Rigsdag*. The Danish judicial system called forth a considerable amount of discussion, and inquisitorial procedure in the courts was attacked as being an anachronism in a country where representative government exists. Certain instances of alleged injustice were brought forward in the *Folkething*, but the minister of justice pointed out that that body was constitutionally incompetent to criticise in the matter of judicial decisions. This statement, though unquestionably correct, was unfavorably received by the Left, and the Socialists demanded a reform of judicial procedure, particularly with regard to criminal cases. Although the minister stated that he was ready to propose such a law as soon as possible, and would probably have presented it in the present session had not the members taken up so much time with economic questions, the *Folkething* passed a vote of censure by a large majority. There was also considerable friction in Denmark between the Liberal and Conservative elements, arising from what the former believed to be the unjust treatment by the government of certain officials who favored Liberal ideas.

These various points of disagreement made it certain that a Liberal victory would result in the elections of April 3, 1901. These elections were noteworthy in that for the first time the secret ballot was used. In the last *Folkething* the Right had 16 seats; in the new the number was reduced to 9, while the Moderates were reduced from 21 to 15. On the other hand, the Left Reformist party increased its members from 63 to 74 and the Socialists from 12 to 14.

The overwhelming defeat of the Conservatives led the old king—he was 83 in 1901—to approve the formation of his first Liberal ministry. This action was regarded as one of great constitutional significance, being the recognition on the part of the king of ministerial responsibility to the *Folkething*. Upon the king's request the ministry of M. de Sehested, who came into power April 27, 1900, resigned, and Professor J. U. Deuntzer, of the University of Copenhagen, on July 23 completed the formation of a new ministry, composed entirely of the opposition, as follows: Premier and minister for foreign affairs, Professor Deuntzer; the interior, M. Everold Sørensen; justice, M. Alberti; finance, M. Hage; war, Colonel Madsen; marine, Admiral Jöhnke; public instruction, M. Christensen; agriculture, M. Ole Hansen; public works, M. Hörup. M. Hörup is the editor of *Poliken*, an important radical organ of Copenhagen. As he is a leading advocate of the alliance between the Left and the Socialists, his presence in the cabinet seemed to indicate that this alliance would continue for some time, although M. Alberti has long been an enemy of socialism. With the exception of M. Hage, the members of the new ministry represent the common people. On September 1, 1901, a large delegation of Liberals assembled in Copenhagen and presented an address of thanks to the king for appointing a ministry representative of the popular mind.

The *Rigsdag* convened on October 4, 1901, and for the first time since 1884 was opened by the king in person. The ministerial programme included tax reform,

improvements in the judicial system, a more adequate and suitable system of defense, industrial and ecclesiastical improvements, and the better development of communal affairs.

For the colonies of Denmark, see **DANISH WEST INDIES, GREENLAND, and ICELAND.**

DE PUY, WILLIAM HARRISON, American clergyman and editor, died at Canaan, Conn., September 4, 1901. He was born at Penn Yan, N. Y., October 31, 1821, and was educated at Genesee College (now Syracuse University). Entering the Methodist ministry in 1845, he remained in pastoral work until 1848. In 1851 he was made professor of mathematics and natural history at the Genesee Wesleyan Seminary, and from 1855 to 1865 filled various pulpits at Buffalo, N. Y., in the latter year becoming associate editor of the *Christian Advocate*, in which position he remained for 25 years. He wrote *Three Score Years and Beyond* (1877); a *Compendium of Useful Information* (1878); and was editor of the *People's Cyclopaedia* (1879) and of the American Revision of the *Encyclopædia Britannica* (1891).

DESIGN, NATIONAL ACADEMY OF, located at Amsterdam Avenue and One Hundred and Ninth Street, New York City, has the following classes in full operation: The Free School of the Academy—Antique classes, drawing from casts, have three sessions, morning, afternoon, and evening; Competition class, meeting every two weeks; Sketch class, where students pose in turns daily. There are special classes maintained under the direction of the academy for the benefit of advanced students, viz.: Life classes, drawing from living model; Painting classes, painting from living model (head); Still-Life class, painting from still life; Etching class, once every week, and Illustration class, for men and women. The Free Antique classes are open daily from October to May, Sundays excepted. Admission to the Free School is obtained through the examinations held the first week in October and February of each year. Applicants for the examinations must register at the office of the Academy during the last week of September or January. All applicants are required to make a drawing from the antique, to be submitted to the committee for approval. The class in coin and medal designing, die-cutting, etc., is under the joint patronage of the American Numismatic and Archaeological Society and the National Academy of Design, its purpose being to impart to pupils the necessary knowledge to enable them to produce artistic coins and medals. Instruction is also given in ornamental designing and modeling in relief. The Woodbury and Langdon prizes, amounting to \$100, are available for work in this class, and are offered for the most creditable progress made during the school year ending in May, 1902. Other prizes are the Suydam and Elliott medals in silver and bronze for the best drawing in the life and antique schools, figure and head classes. The Hallgarten money prizes in painting and composition; painting, first prize, \$60; second prize, \$40; composition, first prize, \$60; second prize, \$40. The Albert H. Baldwin prizes in etching class, first prize, \$30; second prize, \$25. The awards of prizes, however, are subject to the application of a resolution passed by the council in May, 1898, to the effect that the council has reserved the right to withhold all or any of the prizes if the merit or quality of the work in competition does not justify the award. Students are liable to dismissal at the option of the school committee for irregular attendance. The National Academy of Design was founded in 1826 and has now a membership of 167, made up of 96 academicians and 71 associates. President, Frederick Dielman; secretary, H. W. Watrous.

DESJARDINS, ACHILLE-ARTHUR, French judge and publicist, died in Paris, January 17, 1901. He was born at Beauvais, November 8, 1835, and studied law at Paris, receiving his degree in 1858. He was appointed advocate-general at Aix, 1864; attorney-general at Douai in 1873, and at Rouen in 1874, and became advocate-general of the Court of Cassation in 1875. He was also a member of the Academy of Sciences from 1882, and an officer of the Legion of Honor from 1892. M. Desjardins was an eminent writer on international law and other legal subjects, some of his works being, *De l'aliénation et de la prescription des biens de l'état, des communes et des établissements publics* (1862); *Les Devoirs* (1865); and *la Nouvelle Législation de la presse* (1867). In the Dreyfus affair his vote finally went for a revision of the case, although he was originally opposed to it.

DIAMONDS. See **GEMS.**

DIARRHŒA. See **COCHIN-CHINA DIARRHŒA.**

DIET. See **FOOD.**

DIPHThERIA. The employment of the antitoxin treatment of diphtheria became more general in 1901, and but few dissenters from the prevailing opinion remain. Antitoxin has reduced the mortality one-half, in the cases in which it is used early. Prompt injection of maximum doses, repeated according to individual conditions, gives almost uniformly good results. Escherich, in the *Berliner Klinische Wochenschrift*, 1901, No. 2, p. 38, recognizes three varieties of diphtheria, as stated

in the following translation in the *Philadelphia Medical Journal*: "(1) The local variety, with slight susceptibility to the action of the toxin, and locally limited superficial predisposition; (2) the progressive variety, with slight susceptibility to the action of the toxin, extensive superficial predisposition, and extension to the passages; (3) the toxic-septic variety, (A) with marked susceptibility to the action of the toxin, and circumscribed local lesions (hypertoxic variety), (B) with marked susceptibility to the action of the toxin and local mixed infection, (a) with pyogenic cocci (phlegmonous, necrotic, septic variety), (b) with putrefactive processes (fetid variety), (c) with gangrene (gangrenous variety), (d) with the hemorrhagic diathesis (hemorrhagic variety). An analysis of the cases under observation, classified according to this plan, shows that in the preantitoxin period, from 1890 to 1894, there were treated 115 cases of diphtheria, with a mortality of 45.2 per cent. Of these cases, 30 were classified as localized, 74 as progressive (croup), 11 as septic-toxic, the mortality in each group being, respectively, nil, 55.4 per cent. and 100 per cent. In the succeeding (antitoxin) period, from 1894 to 1899, there were treated 1,147 cases, with a mortality of 13.08 per cent. Of these, 593 were localized, 378 progressive, 176 septic-toxic, and the mortality was, respectively, 0.17 per cent., 19.58 per cent., and 42.62 per cent." See ANTITOXIN and VITAL STATISTICS.

DISCIPLES OF CHRIST. The CHRISTIAN CHURCH, the followers of which are known popularly as Campbellites, or Campbellite Baptists, a name derived from that of their leader, originated in Kentucky in a movement for Christian union on the basis of a pure New Testament church in 1804, and dates its organization from 1827. Since that time a remarkably rapid growth has placed the church among the leading denominations of the United States, in 1901 ranking sixth. It has 1,179,541 members, 10,680 churches, with a property valuation of \$18,786,946, and 6,385 ministers, and 8,002 Bible schools in which are enrolled 744,450 members—statistics which present a material growth also in the past year. In addition to this constituency, there are 12,100 Disciples in Canada, 13,874 in Australia, 14,000 in Great Britain, and 95,000 in the foreign missionary fields. For 1901 contributions aggregated \$6,332,872, of which \$611,220 were devoted to missionary enterprises through the agency of the various societies and boards, and the remainder to educational work and other benevolences. The church controls, besides a number of female colleges and secondary institutions, 21 colleges and universities, attended by 5,522 students, of whom 801 are theological students, with libraries aggregating about 75,000 volumes, and having endowment of \$1,602,000 and property valued at \$1,717,500. Its publishing activities include 58 State and national religious journals. The Christian Church is known for its enterprise along lines of sectarian education and of missionary extension, the completeness of organization in the latter field being illustrated by 43 State and Territorial organizations (besides auxiliary bodies in cities and districts, each city, district, State, and national society having at least one convention during the year), and a National Foreign Christian Missionary Society, American Christian Missionary Society, and Christian Women's Board of Missions. The third annual congress of the church was held March 26-28, 1901, at Lexington, Ky. The central theme discussed was "Evolution" in its various phases of relation to Christian faith, to religion, and to the doctrine of redemption. A feature of the congress was a movement for a national education society, and another, of interest as the first of its character here, was in behalf of an international federation of religious bodies, the scheme, as projected, aiming to create an international church, the affiliation of individual churches to be based on a platform of common interest, though each body, an auxiliary to a general congress, would retain its prevailing creed. The number of the usual summer assemblies of Disciples, which are held in Indiana, Illinois, Virginia, and Kentucky, was increased by the dedication on July 4, of a tabernacle in a new religious resort on the Delaware coast which was named Bethany Beach. At the national convention in Minneapolis, in October, 1901, attended by some 3,500 delegates, the reports of the various missionary societies were rendered, indicating a year of progressive activity, and plans for the ensuing year were formulated. The organization of a considerable number of new churches and the addition of 25,000 new members were reported as the result of the year's work in the domestic department, while in the foreign fields, additional work was undertaken in Africa and the Philippines. There are now stations in 12 foreign lands, on every continent except South America, and a force of 275 missionaries, including native helpers. Educational and medical work and special interest in the care of the famine sufferers of India are features of the foreign missionary enterprise of the church. The national convention of 1902 will meet in Omaha.

DISTRICT OF COLUMBIA. The seat of the government of the United States, co-extensive with the city of Washington. It was formed March 30, 1791, by a cession of land, amounting to 100 square miles on both sides of the Potomac River, to the United States by the States of Maryland and Virginia. It formerly comprised two counties, Alexandria and Washington. Alexandria County, however,

was re-ceded to Virginia on July 9, 1846, and in 1874 the county government of Washington was abolished. The total land area of the District is approximately 60 square miles. The population in 1890 was 230,392, and in 1900, 278,718, while in 1901 it was estimated at 283,718.

Government.—The present government of the District of Columbia was instituted in 1878, when the administration of the District was given by act of Congress to three commissioners, two of whom are appointed by the President of the United States from citizens of the District having three years' residence therein, while the third is detailed by the President from the corps of engineers of the United States Army. The citizens of the District have no voice or vote in the government. The commissioners appoint all the subordinate municipal officers. The present commissioners are Henry B. F. McFarland (Rep.), John W. Ross (Dem.), whose terms expire May 2, 1903, and Major John Biddle (non-partisan), who holds office during the pleasure of the President. The secretary is William Tindall.

Agriculture.—Agricultural interests in the District of Columbia are such as are usually found contiguous to a prosperous city. The acreage devoted to agricultural products has steadily declined, the acreage in 1860 being 34,463, and in 1900, 8,489. Much of the land used for agricultural purposes is at present being operated at a loss, and is only held for the increased value that it will bring in the future for residential purposes. Vegetable farms, dairy farms, florist establishments, and fruit farms constitute the greatest part of the agricultural investments. Cows seem to thrive especially in the atmosphere of the capital, the total number since 1890 having increased by 45 per cent., while the amount of milk which they have furnished to the residents of the city has increased by 84.9 per cent. Lands used for commercial floriculture are valued, together with improvements, at \$4,063,500, or 36 per cent. of the value of all agricultural land. An interesting feature of the distribution of the ownership of farm lands in the District is that of the 8,489 acres devoted to farming, negro farmers possess only 29 acres. This fact is somewhat astonishing, in view of the early emancipation of negroes in the District of Columbia and the unofficial aid extended to them from many quarters.

Manufactures.—Washington is not a manufacturing city in the general significance of the term, and nearly all the industries reported by the census in 1900 were what may be called neighborhood industries; that is, industries producing articles for local consumption. Including government establishments, there was invested in the 2,754 industrial concerns reporting, active capital to the amount of \$41,981,245, producing a product of \$47,667,622. To obtain this product, \$14,643,714 was expended for wages, \$19,369,571 for materials, and \$4,433,652 for miscellaneous expenses. Of the total value of the products, 20.6 per cent. was the product of governmental establishments and institutions. The number of persons employed in all mercantile establishments reporting was 8.9 per cent. of the total population of the District.

Finance.—The revenues of the District for the fiscal year ending June 30, 1901, were \$8,725,946.18, derived as follows: From taxes and other District sources, \$3,387,635.73; surplus revenues from previous years, \$387,577.18; unexpended appropriations, \$546,008.93, advanced from the United States treasury by an act of Congress, February 11, 1901, \$220,182.57, and the amount contributable by the United States to meet its proportion of the District's expenses under the organic law, \$4,184,541.77. The unexpended appropriations at the close of the year were \$546,008.93. The funded debt of the District on June 30, 1901, was \$15,070,180.18. No portion of this, however, was incurred under the present form of the District government. The total assessed value of taxable real estate and personal property in the District of Columbia on July 1, 1901, was \$198,488,413. The taxes imposed upon this property amounted to \$3,014,360.39. The general tax rate was \$1.50 for each \$100 of all property except that used solely for agricultural purposes, where the rate was \$1 per \$100 assessed valuation.

Education.—The report of the superintendent of schools for the year ending June 30, 1901, shows a total enrollment of 47,431 pupils, of whom 31,851 were white and 15,580 were colored. The whole number of teachers employed, including teachers of kindergartens, was 1,283, of whom 857 were white and 426 were colored. The increase of the enrollment of the year, 912, was somewhat less than 2 per cent. The number of half-day schools was 349, of which 92 were in grades above the second. For the past two years Congress has been making generous provision for new school houses, and if this liberal policy is continued it is expected that half-day schools will soon be unnecessary. The construction of two completely equipped manual training schools neared completion during the year. For more than a decade Washington has had one of the most complete systems of the manual training in elementary schools to be found in the country, and it is believed that the occupation of the new schools will mark an epoch in this development. Hitherto some difficulty has been experienced in inducing the girls in the manual training schools to study the distinctive features of the work there, but in the new school these features

will be made obligatory, and the previous defect, it is hoped, cured. The malady and the proposed remedy is thus described by the superintendent of schools: "In the mad race for the normal school our girls have ceased at the portals of the high school to be interested in stitches and gussets, in roasts and pastries, not from choice, but because the pathway of preferment has not lain through the fields of domestic science and art, but by way of the academic studies alone. This is all changed in the new courses of the manual training schools, and now advanced cookery, the work of the diet kitchen, millinery and dressmaking, become a part of the curriculum in the preparation for the normal school."

Congressional Legislation.—The celebration of the centennial of the establishment of the seat of government in the District of Columbia was held on Wednesday, December 12, 1900. The celebration was followed by a general popular demand that Congress should enact legislation for the improvement of the District. Congress responded to this demand, and in accordance with the recommendations of the District commissioners, made large appropriations for the year and authorized the advancing of money from the federal treasury to meet anticipated deficiency in the District revenues, so that no delay might be experienced in providing for the completion of a sewerage disposal system for Washington, the construction of a water-filtration plant, and the establishment of adequate water supply. Moreover, at the extraordinary session of the Senate held in March, a commission of eminent architects and landscape engineers was created to prepare a general plan for the improvement of the public park system of the District. (See article ARCHITECTURE.) This action was the result of efforts that had been made for several years by the commissioners and citizens of the District to have adopted a comprehensive scheme of park improvements. Another important act passed by Congress on March 3, 1901, established a code of laws for the District of Columbia, to take effect on January 1, 1901. This legislation was urged by the District bar in order to institute a systematic and authoritative arrangement of the laws and court procedure of the District. The new code, however, does not comprehend the mass of the laws relating to the administration of the government of the District, and the necessity of embracing these various municipal ordinances and regulations into a unified code is urged by the attorney for the District in his annual report.

DOMINICA. See LEEWARD ISLANDS.

DOMINICAN REPUBLIC. See SANTO DOMINGO.

DONNELLY, IGNATIUS, American author and politician, died at Minneapolis, January 1, 1901. He was born at Philadelphia, November 3, 1831, and was admitted to the bar in that city in 1852. Four years later he removed to Minnesota, and became actively concerned with State and national politics, being lieutenant-governor and governor, 1859-63, and member of Congress, 1863-69, as a Republican. After his return to private life he was editor of the *Anti-Monopolist*, a newspaper whose name explains its attitude toward combinations of capital and which advocated the policy of the "Greenbackers." He was repeatedly elected to the Minnesota Legislature, and was twice nominated for Vice-President of the United States, in 1896 by the People's Party and in 1900 by the "Middle-of-the-Road" Populists. While in Congress he was vigorous in the support of measures to create the National Bureau of Education and originated legislation providing for the planting of trees by the government. But it is in his writings that Mr. Donnelly's claim on remembrance lies. All of them display an eccentric ingenuity, but while attracting considerable attention have never been regarded seriously. His principal publication is *The Great Cryptogram* (1887), in which, by the application of Bacon's word-cipher to the First Folio of 1623, Mr. Donnelly attempts to prove the Baconian authorship of Shakespeare. Others are *Atlantis* (1882), an alleged proof that a large island of this name, well known to the ancients, once lay in the Atlantic in the same latitude as Gibraltar; *Ragnarök* (1883), an explanation of geological formations of the drift age by contact of comets with the earth; and *The American People's Money* (1895).

DRAMA. Of playwrights, the most conspicuous figure on the American stage in 1901 has been Mr. Clyde Fitch. During that year five original plays from his hand and one adaptation from the French have been acted for the first time—*The Climbers*, by Miss Bingham and her company; *Captain Jinks*, by Miss Barrymore and hers; *Lovers' Lane*, by a specially chosen cast; *The Way of the World*, by Miss de Wolfe and her company; *The Girl and the Judge*, by Miss Annie Russell and hers; and *The Marriage Game*, an adaptation of Angier's *La Mariage d'Olympe*, by Miss Martinot and hers. *The Marriage Game*, which vitiated Angier's veritistic comedy by the shifting of the scene to England and the anglicizing of personages and of a point of view essentially French, may be dismissed as journeyman's work that attracted little public notice. *Captain Jinks*, in its turn, was a very light, episodic, and somewhat fantastic comedietta, following with felicity and charm the

amatory adventures of an imaginary and youthful prima donna with the golden youth of New York in the "early seventies." It contained adroit reflections of the superficial life of that time, but in material and purpose it was largely fantastic. *Lovers' Lane*, while purporting to be a comedy of rural life in New England, revealed for the most part the conventional personages of American rural drama in the conventional, quasi-sentimental way.

In the three remaining plays Mr. Fitch has sought to deal truthfully, penetratingly, and more or less seriously with aspects of American life and with American personages as they exist to-day, especially in cities and large towns—a task that few American playwrights have set themselves and that none has achieved with such success. Mr. Fitch chose the personages of *The Climbers* from the newly rich and socially ambitious of New York to-day, and wove his play about the weakness of a well-intentioned man whom financial and social aspirations drive into various knaveries, and the contrasting strength of his wife and a friend who is half-a-lover. The merit of the play, though it does not lack constructive skill and emotional appeal, lay most in its keen, truthful, and felicitous picture of certain phases of contemporary life in New York. *The Way of the World*, a less serious and less dexterous play, was an attempt to mirror the manners of the socially elect in New York and the superficial aspects of a political campaign. *The Girl and the Judge*, as light a piece, draws its personages from the great American middle class, sets them in a Western town, and makes them revolve about the fortunes of a young girl with a dipsomaniac father and a kleptomaniac mother, and of the judge who is concerned in the divorce sought by the one and in the thefts of the other. Here, again, there is significant and felicitous, but less closely observed, characterization. It was easy to indicate Mr. Fitch's more obvious shortcomings—his unevenness of construction, his tendency to catch at the readiest theatrical expedient, his liking for stage effect that will a little startle his audience, the occasional dullness of his wit—but in a single year he has established his position as an American playwright who observes shrewdly and mirrors truthfully and significantly certain aspects and personages of our urban life. His work, moreover, has found much and continuing public favor.

Mr. Augustus Thomas, who in *Arizona*, *Alabama*, and other plays has proved himself as close an observer and as skilful a dramatist of the simpler, ruder, and out-of-door American life of our time in the Far West and in the South, fell away in *Colorado*, acted by a specially chosen cast, into conventional and indifferently made melodrama in which he sacrificed his wonted truth and humor of characterization to the making of stage "points" in crudely theatrical fashion. On the other hand, in *On the Quiet*, a farce acted by Mr. Collier, he produced an amusing piece of genuine American flavor, alike in personages and incidents, speech and humor, independent of both French and English models and deserving of the success it achieved. French farce indeed, that turns upon amatory embarrassments and marital infidelities, has for the time lost the favor of American audiences.

Several "rural dramas"—*Eben Holden*, drawn from the novel of that name and acted by Mr. Holland; *Sky Farm*, *New England Folks*, *Under Southern Skies*—have purported to deal with American life on farm or plantation. In the main, however, they have set the conventional personages of such pieces in the conventional frame, portraying the accepted incidents and coloring them with the accepted humors and emotions. In their minor personages there have been occasional instances of genuine characterization. One other attempt, beside Mr. Fitch's, to set our urban life on the stage—Mrs. Burton Harrison's *The Unwelcome Mrs. Hatch*, acted by Mrs. Fiske—was in large measure ineffective, partly through the 'prentice hand of the playwright, which shaped a thin plot inaptly and barely sketched her personages, and partly through a purely conventional treatment of the pursuit of her child by a divorced and distressed mother. Still another venture with a very different aspect of urban life—Mr. Klein's *The Auctioneer*—proved eminently successful. Its chief personage, a Jew of the East Side of New York, undergoes as a petty and tricky auctioneer, as a man of means living "uptown," and as a street peddler, all the vicissitudes of prosperity and adversity, in an appropriate environment of local scenes and personages. Much more than the playwright, Mr. Warfield, who plays the part, characterizes the Jew with persuasive insight, truth, comic and pathetic felicity, and the utmost fidelity of detail. Unfortunately, in the desire of playwright and manager to make Mr. Warfield a "star," the other East Side types, which promised much, were left only sketches. A single venture into American historical drama, Mr. Shippen's *D'Arcy of the Guards*, acted by Henry Miller, a pleasant comedy of the Revolution, passing in Philadelphia during the British occupation, deserved more vogue than it won.

On the whole the romantic drama, especially the romantic drama drawn from current and popular printed romances, found less favor in 1901 than in the previous year. Dramatizations of Miss Johnson's *To Have and to Hold*, acted by a special

cast; of Mr. Hewlett's *The Forest Lovers*, acted by Miss Galland; and of Miss Runkle's *The Helmet of Navarre*, acted by Mr. Dalton, all failed. The original romances have been widely enough read to quicken public curiosity to see their personages and incidents on the stage; but the transfer thither was clumsily done; the material bore ill the transfer; and the result was usually crude and disjointed melodrama with little real romantic flavor or atmosphere, and, in the case of *The Forest Lovers*, less poetic savor. On the other hand, "stage versions" of Mr. Major's *When Knighthood Was in Flower*, and of Ouida's *Under Two Flags*, which were no whit more deserving, enjoyed much popularity, due in large part to the established reputation of Miss Marlowe, who appeared in the one, and to the warm and robust acting of Miss Bates—one of the rare young American actresses with real passion in her—who impersonated the heroine of the other. In similar fashion, the real romantic ardor and glamor of Mr. Bellew's acting, to say nothing of its technical felicity and symmetry, carried a yet more clumsy dramatization of Mr. Weyman's *A Gentleman of France* to favor. An adaptation, with material changes in character and incident, of Mr. Tarkington's *Monsieur Beaucaire* served a like purpose for Mr. Mansfield. The play itself, a prettily disguised melodrama in which porcelain puppets stepped down from the shelf and spoke their mincing speeches and had their little adventures in the dress and surroundings of the eighteenth century in England, was more delicate and deft than most of its kind. It afforded also an admirable vehicle for the art of Mr. Mansfield in its lighter aspects. Rarely, of late years, has he acted with such grace and glamor and pictorial effect, with such lightness and elegance of tancy, touch, and speech, with such charming and versatile artifice. Mr. Stoddard, the veteran, lent like personal distinction, though in the very different vein of harsh and poignant revelation of the deep and primitive emotions of a misunderstanding and long unrelenting Scotch father to a passable dramatization of Ian Maclaren's *Bonnie Briar Bush*. Finally, two new versions of the old romantic play of *Don César de Bazan*—one made by Gerald du Maurier, acted by Mr. Faversham, and called *A Royal Rival*; the other made by Victor Mapes, acted by Mr. Hackett, and called *Don César's Return*—proved but futile rattlings of dry bones, upon which neither revisers nor actors put real dramatic flesh and blood.

The two original romantic plays of the year, Mr. Lawrence Irving's *Lovelace* and Mr. Huntley McCarthy's *If I Were King*, both acted by Mr. Sothern, excelled all the adaptations and stage versions of passing novels. *Lovelace* follows the fortunes, real and fancied, in love-making and in verse-making, on the field of battle and in destitute lodgings, of the poet and cavalier of the court of Charles I., culminating, after two acts of preparation, in a third of high, if sombre, imagination and moving climactic power. *If I Were King* likewise has a poet for its hero, François Villon, and the Paris of Louis XI., just emerging from the Middle Ages into the Renaissance for its picturesque environment. The playwright makes the poet for a week master of France, with his head as a price of the royal caprice, were it not that the noble lady for whose heart Villon has sued finds another and gentler penalty. The play was notably well made and interesting, abounding in the glamor, the warmth, brightness, and general picturesqueness of genuine romantic drama. The personages were of real flesh and blood, heated by becoming romantic ardor; their speech was felicitous, their actions adroitly contrived. The whole piece, in fine, had enough imagination, romantic, and, on occasion, poetic quality and atmosphere to give it, with its theatrical fitness for its purposes, distinction. To both the parts of *Lovelace* and Villon, Mr. Sothern brought the finer qualities of his maturing art—qualities that meet half way imaginative romantic drama.

On its pictorial side, in its distortion of historical and quasi-historical personages for theatrical ends and in the primitive frankness of its emotional content, Mr. Belasco's *Du Barry* may fall into the category of romantic drama. In fact, however, it is *sui generis*—big and inchoate yet teeming with detail, mechanical yet reflecting with imagination the superficial aspect of two epochs, crude in characterization and incident yet deftly contrived. Pictorially it shows vividly and with full command of every material theatrical resource the outward semblance of the Paris and the Versailles of Louis XV. and of the Terror. In this environment it follows the life of the famous mistress of that prince from the milliner's shop through the palace to the guillotine, now clinging close to ascertained fact, now clothing her with new and strange virtues. Moreover, the passions of this *du Barry* are precisely those that suit the primitive temperamental force of Mrs. Leslie Carter, who plays the part. Throughout pictorial subtleties jostle mere bigness, crudeness, and stage mechanics.

From European dramatists, and especially from English hands, our theatres in 1901 drew much fewer plays than usual. The London theatres, upon which our managers must depend, have been busy with revivals of Shakespeare, with poetic dramas, or with contemporary comedies of sentimental and sexual infelicities ill-

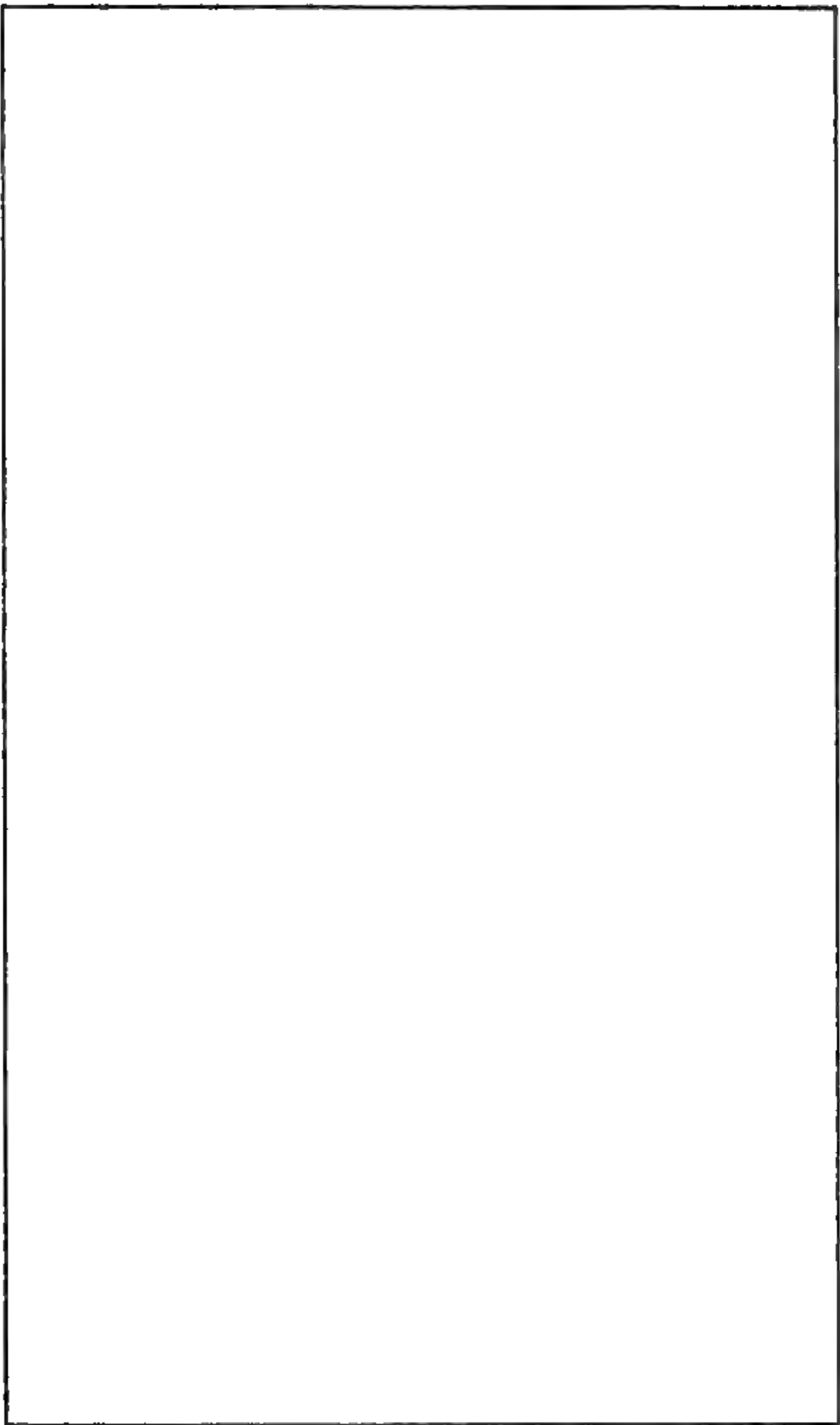
suited, in the managerial view, to our stage. There have been many failures and revivals in London. Paris, with its *pièces à thèse* and mimic pictures of a life strange and incomprehensible to American audiences and its ludicrous farces, has also been unusually barren. None the less, Captain Marshall, one of the most promising of the younger English playwrights, provided, Mr. Drew with an adroit, human, truthful, and charming sentimental comedy, with a sting of pathos underneath, of English military life on the eve of the Boer War, *The Second in Command*, and a part admirably suited to the actor's powers. Mr. Esmond likewise gave Miss Anglin and Mr. Richman an imaginative and graceful comedy, *The Wilderness*, charged in its final episode with deeper human feeling, in which he lets his fondness for sentiment run into frequent sentimentality. For Miss Adams, Mr. Barrie, the novelist, also contrived a pretty comedy of sentiment and fantasy, *Quality Street*. For two acts it reflects the life of the quietest and most respectable of spinster folks in a little English provincial town during the Napoleonic war, with the simplicity, insight, gentleness, humor, and dexterity of Miss Austen herself, and with skillful understanding of delicate stage effect. Then it runs away, with the amatory adventures of the heroine, into sheer, bubbling fantasy. Then it ends thinly and feebly, but with room always for the play of Miss Adams' familiar traits. From England, too, came a dramatization of A. E. W. Mason's novel, *Miranda of the Balcony*—a play of serious emotions and picturesque Spanish and African environment—in which Mrs. Fiske acted impressively.

Of revivals only two require note—the one of Sardou's *Diplomacy*, by the company of the Empire Theatre, New York, which lacked the polish of high comedy; the other of *Uncle Tom's Cabin* for the first time in a spectacular setting.

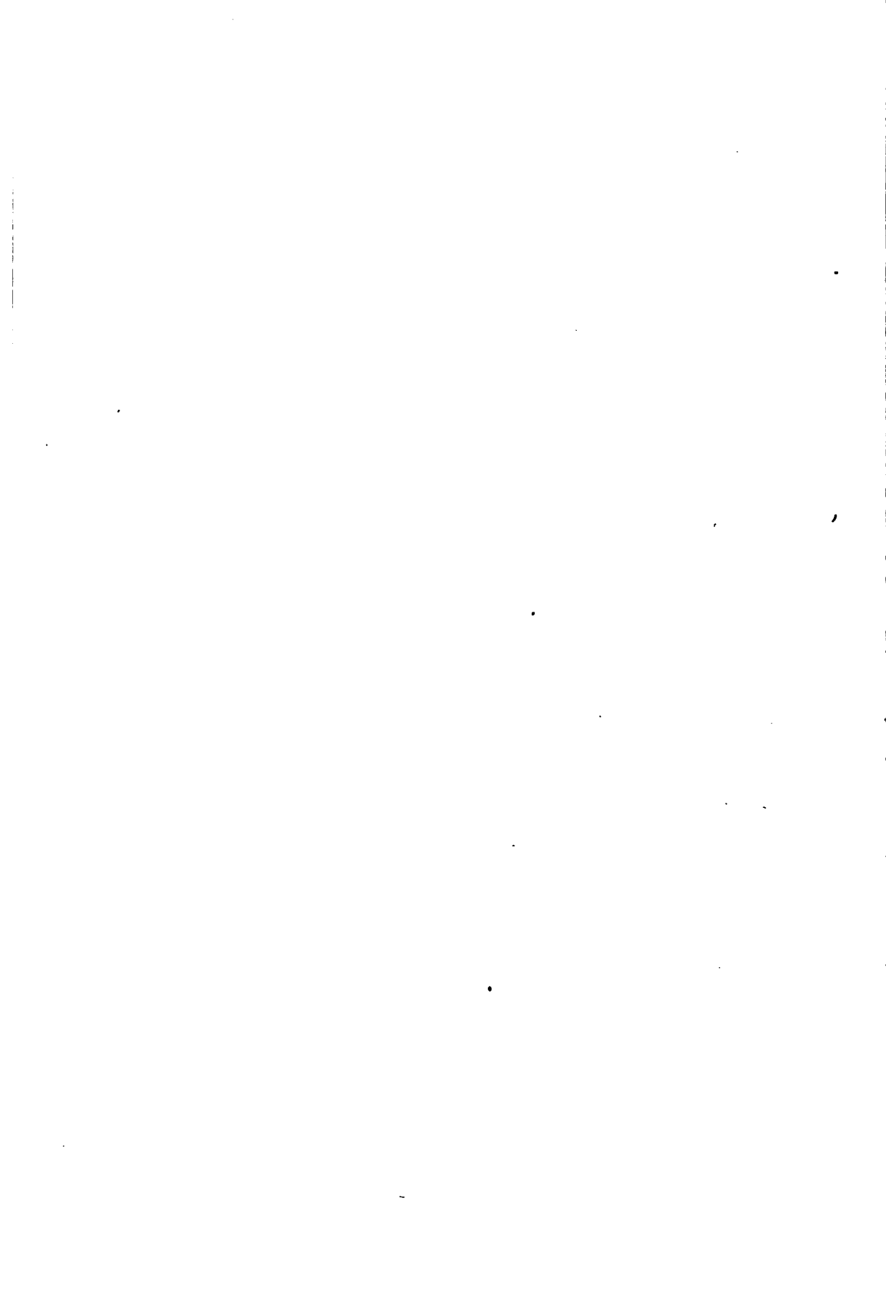
Of visiting players, Sir Henry Irving and Miss Terry have again made an American tour, reviving Mr. Willis' tragedy, *Charles I.*, appearing in Sardou's *Mme. Sans-Gêne* for the first time on this side of the sea, and repeating more familiar plays and parts. Both have been well received, but both as unmistakably have passed their acting prime. From England also has come for the first time Mr. Hawtrey, a comedian of personal distinction, naturalistic method, quiet sense of humor, much polish and finesse, and adroit command of the more delicate resources of his art. A single fantastic play of contemporary London life, *A Message from Mars*, has sufficed him. Finally, on the last day but one of the year, Mrs. Patrick Campbell, the foremost of the younger and more serious-minded English actresses, made at Chicago her first appearance in America, acting the heroine in Sudermann's *Magda*. Other plays followed, so that she belongs properly to the record of 1902.

During the early part of the year Mme. Sarah Bernhardt (*q.v.*) in company with the elder Coquelin (*q.v.*), made an extended tour of the United States, beginning and ending in New York. Mme. Bernhardt appeared in two of her old parts, *Fédora* and *La Tosca*, and in two new rôles, the Duke of Reichstadt, in Edmond Rostand's *L'Aiglon*, and in *Hamlet*. As the consumptive hero of Rostand's melodrama, Mme. Bernhardt made use of her long acquaintance with *Camille*. Her *Hamlet* as a *tour de force* was an excellent piece of work. M. Coquelin's Flambeau in *L'Aiglon* and First Gravedigger in *Hamlet*, were beautiful examples of character portrayal executed in the finest spirit of classic French art.

In London in 1901 Sir Henry Irving unsuccessfully revived Shakespeare's *Coriolanus*; Mr. Forbes Robertson was not acting; Mr. Tree revived Shakespeare's *Twelfth Night*, with an opulent and illusive setting, and followed it with Mr. Fitch's pictorial play, with D'Orsay as its principal figure, *The Last of the Dandies*. Mr. Alexander and Mr. Wyndham busied themselves with comedies of contemporary life by Mr. Chambers and Mr. Isaac Henderson; a specially chosen cast acted Mr. Pinero's newest play, *Iris*, in which he reverts once more to distorted and unhappy sexual relations and to subtle analysis of a contradictory and perverted heroine; Mr. Esmond has, had similarly acted yet another ultra-sentimental play; Mrs. Campbell has appeared in Björnson's moving Scandinavian drama of faith and miracle, *Beyond Human Power*, and Mr. Gillette, the American actor, has achieved much public favor as Sherlock Holmes. In Paris, the internal discipline of the Théâtre Français has been changed for the first time since the Moscow decree of the first Napoleon, to the increase of the directors' and the lessening of the actors' control of the house and its plays; MM. Capus and Levédan have confirmed their positions as graceful, amusing, subtle, ironic, and adroit makers of plays of contemporary Parisian life of the aristocratic and boulevard sort; MM. du Curel, Brieux, Hermant, and other practitioners of the *pièce à thèse* have worked in their usual vein, and so boldly that the censorship suppressed the newest of M. Brieux's plays, and M. Hervieu has had acted at the Théâtre Français a sombre and powerful drama of marital infelicity, *L'Enigme*. In Germany the dramatists of established reputation have produced characteristic, but not especially noteworthy, pieces, while no new playwrights have risen to rival them. In Italy d'Annunzio has written and Duse has acted a tragedy that tells with overflowing poetic beauty and high and



FRENCH ACTORS.—Madame Sarah Bernhardt (Upper). Coquelin the Elder (Lower)



moving dramatic power the tale of Francesca da Rimini and incidentally pictures mediæval Italy.

DRUG HABIT. See COCAINE HABIT, MORPHINE HABIT, PETROLEUM DRINKING.

DRYGALSKI, ERIC DAGOBERT VON, the Prussian explorer, who led an expedition to the Antarctic region in 1901, was born at Königsberg, Prussia, February 9, 1865, and was educated at Königsberg, Bonn, Leipsic, and Berlin. From 1888 to 1891 he was an assistant in the Geodetic Institute and the Central Bureau of the International Geographical Society at Berlin, and headed two expeditions to the west coast of Greenland, in 1891 and in 1892-93, which were sent out by the society. The expedition led by Dr. Drygalski in 1901 was backed by the German government, and its objective point is Kerguelen Island, where a magnetic station is projected from which other expeditions will start. He is expected to return in 1904. An account of the West Greenland expedition was published in the Geographical Society's annals (1891-95), and he has published the results of other exploring expeditions. See ANTARCTIC EXPLORATION.

DUFFIELD, JOHN THOMAS, American educator, died at Princeton, N. J., April 10, 1901. He was born at McConnellsburg, Pa., February 10, 1823, graduated at the College of New Jersey in 1841, and entered the Princeton Theological Seminary in 1844. Shortly afterward he was elected a tutor in Greek in the college, became assistant professor of mathematics in 1847, and seven years later was given the emeritus chair of mathematics. He was licensed to preach in 1849, and for several years occupied the pulpit of the Second Presbyterian church at Princeton. He received the degree of D.D. from Princeton in 1872, and that of LL.D. from Lake Forest University in 1890. Professor Duffield wrote much on current religious topics, and for a long time managed the distribution of funds to needy students of Princeton University.

DUNANT, Dr. JEAN HENRI, the Swiss physician and philanthropist who received one-half of the Nobel prize (*q.v.*) for the encouragement of peace and arbitration, was born at Geneva, Switzerland, May 8, 1828, and was educated as a physician in his native country. His great work was in the agitation for the better care of the sick and wounded in time of war, and his book, *Un Souvenir de Solferino* (1862), did much toward the establishment of medical camps in the continental armies, and led to general consideration of the subject. His other books include *Fraternité et Charité internationales en temps de guerre* (1864), *L'empire romain reconstitué* (1859), *La régence de Tunis* (1858), and *La renovation de l'Orient* (1865).

DUNGLISON, RICHARD JAMES, American physician and author, died in Philadelphia, March 4, 1901. He was born in Baltimore, November 13, 1834, and after graduating at the University of Pennsylvania in 1852, took his degree in medicine at the Jefferson Medical College of Philadelphia four years later. During the Civil War he was in the government's service as an acting assistant surgeon, on duty at Philadelphia, and later achieved a wide reputation in the medical profession as a practitioner, an author, a member of many medical societies in America and Europe, and as an officer of medical congresses. Dr. Dunglison was the author of *Practitioner's Reference Book* (1877), and *Elementary Physiology* (1879), and revised and enlarged the *History of Medicine* (1872), and *Medical Lexicon* (1874), by his father, Robley Dunglison, M.D. He was also one of the founders and for a long time the editor of the Philadelphia *Medical Times*.

DUNKARDS, TUNKERS, OR GERMAN BAPTISTS, a sect resembling Quakers in simplicity of dress and speech, originated in Germany, and came to the United States in the early part of the eighteenth century. The Brethren Church (Conservative) in this country now numbers about 100,000 communicants, with 2,625 ministers and church property to the value of nearly two and one-half million dollars. It has an extensive printing establishment at Elgin, Ill., which controls a periodical circulation of 100,000, and it maintains seven colleges, with a student enrollment of nearly 2,000. The General Mission Board, endowed with \$500,000, supports missions in Denmark, Sweden, France, Switzerland, and India, and is opening up stations in Canada and extending its home missionary work. The year 1901 was one of progress in the addition of some 5,000 new members, in the increase of mission receipts, and in general improvement along missionary lines. In 1902 the general conference will be held at Harrisburg, Pa., beginning on May 20. Besides the Conservative branch of the Brethren, by far the most numerous, there are three other bodies with comparatively small constituencies; including these the Dunkards number over 115,000, and have 3,000 ministers and 1,100 churches.

DUTCH EAST INDIES, the island possessions of the Netherlands in Asia, comprising the islands of Java, Sumatra, Celebes, parts of Borneo, and New Guinea, Banca, and Moluccas, the Timor archipelago, and a few smaller groups. Their total area is estimated at 736,400 square miles, and the popu-

lation something over 34,000,000, excluding the unexplored regions. Of the inhabitants 32,000,000 are natives, 460,000 Chinese, and 63,000 Europeans. The prevailing religion is Mohammedanism, but there are over 300,000 Christians of various sects. The dependency is divided into two parts, one comprising Java and Madura, where Dutch control is complete and the government well organized, and the other known as the "outposts," including all the rest of the islands, in some of which Dutch sovereignty is merely nominal. At the head of the colonial administration is a governor-general, who is vested with both executive and legislative powers, the latter being exercised subject to the approval of the home government. He is assisted by a council of five members, whose powers are both legislative and advisory. There are two sets of laws in force, one based on the laws of the Netherlands, for the European population, and the other formulated with special reference to the native customs and institutions. This division of the whole population into two classes is recognized as a fundamental principle in the policy of administration and is incorporated into the colonial code. The entire colony is divided into residencies, regencies, and districts, some of which are administered by Dutch officials and some by native chiefs. There is a colonial army of 44,000, mostly natives, and a navy, only partially colonial, of 24 vessels. The revenue and expenditure of the islands in 1900 were 141,989,008 guilders and 147,766,255 guilders respectively, and the estimates for 1901 showed an expenditure of 149,885,383 guilders and a revenue of 149,935,934 guilders. The guilder is worth 40.2 cents. The revenue is derived largely from taxes and the government monopoly on opium and salt. Agriculture is the chief industry and the principal products, with total production for 1898 (last official records) are: Sugar, 1,538,701,400 pounds; coffee, 60,569,600 pounds (156,503,866 pounds in 1897); and tobacco, 85,430,129 pounds. Cinchona, tea, and rice are also produced. There are valuable tin mines in Banca, and coal is mined in Java, Sumatra, and Borneo. The total value of the imports in 1898 was 179,821,432 guilders and of the exports 217,754,097 guilders, four-fifths of the latter going to the Netherlands. At the beginning of 1900 the railways in Java and Sumatra had a total length of 1,338 miles, representing a capital of \$71,556,000; about 1,100 miles belonged to the state. There are 173 public schools of all grades for Europeans, and 20 private schools, with 15,000 pupils enrolled, and 1,200 native schools, public and private, with 134,946 pupils enrolled (1898). See BORNEO, CELEBES, JAVA, NEW GUINEA, and SUMATRA.

DUTCH GUIANA, or SURINAM, a colony of the Netherlands in South America, bounded by the Atlantic Ocean, French Guiana, Brazil, and British Guiana, has an estimated area of 46,000 square miles and an estimated population of 68,972, exclusive of negroes living in the forests. The capital is Paramaribo, with about 31,200 inhabitants. The colony is administered by a governor, assisted by an executive council composed of the governor as president, the attorney-general as vice-president, and three other members, all of whom are nominated by the crown. There is a colonial legislature, most of whose members are elected by limited popular vote. Magistrates of the central court are named by the crown. There are elementary public schools, and normal schools under ecclesiastical control. Educational provisions for the dependent populations are in the hands of the various religious bodies, to which the government appropriates funds. A militia consisting (1898) of 433 men, a civil guard of 1,654 men, and a garrison of 346 men, comprise the armed land force of the colony. Vessels of the Netherlands navy are always stationed along this coast, and there are some guard-ships. The revenue for 1900 was 2,296,000 guilders (guilder equals 40.2 cents), besides a government subvention of 128,000 guilders to balance the expenditure. The revenue is derived from customs, excise dues, and taxes. The chief products are sugar, cacao, bananas, coffee, rice, maize, rum, and molasses. Gold is quite extensively mined, the gold export for 1898 reaching a value of 1,136,606 guilders. The imports for 1900, stated in pounds sterling, were £513,882, exports £461,739. The development of the colony is difficult and slow, owing to the indolent habits of the native laborers.

Chartered sailing vessels from the United States touch monthly at Paramaribo; a steamer of the Royal English mail once in two weeks; and steamers of the Royal Dutch mail line bi-monthly. Inland communication is largely by means of the rivers. There are no railways.

DUTCH REFORMED CHURCH. See REFORMED CHURCH IN AMERICA.

EARTHQUAKES. R. D. Oldham, in the report on the great Indian earthquake of the 12th of June, 1897 (*Memoirs Geological Survey, India*, xxix., 1899), states that it has not been surpassed by any in history. An area of 150,000 square miles was ruined, walls were rent, and water poured out from the fissures. In addition, an area of 1,750,000 square miles felt the shock, and the wave traveled 120 miles per minute. Two hill stations were apparently elevated 20 inches in altitude. A number of faults were noticed on the surface, and one of these had a

displacement of 25 feet and a length of 12 miles. C. Davidson, in an article on the *Progress of Seismology During the Nineteenth Century* (*Knowledge*, xxiv., 1901, pp. 44, 45), describes the advances which have been made since the time of Darwin's *Memoir on the Volcanoes of South America* and the beginning of Perry's *Earthquake Catalogues*. The Japanese earthquake investigating committee has issued numbers 5 and 6 of its publications. They state that in the park at Hongo, Tokio, there has been erected an earthquake-proof house in which two large pendulums are placed for registering earth tremors. Among other articles may be mentioned one by G. Gerland, *Die Moderne Seismische Forschung* (Verh. des vii., Int. Geogr.-Kongr., ii., p. 148, Berlin, 1901).

Few earthquakes of a serious character occurred during the year 1901, and most of these were somewhat limited in their extent. An earthquake was reported from Grazelma, province of Cadiz, Spain, on February 10, 1901, which produced considerable damage to buildings, and caused the disappearance of a body of water which furnished power to the local industries. On March 31, eastern Europe was visited by an earthquake, while shocks were also felt in Italy, and observations were made at the various seismological observatories. On April 24, Rome suffered from an earthquake which inflicted damage on the Pantheon and on parts of the Vatican. Shocks were also experienced on May 11 in Sicily, and at Florence on May 21. Basle, Switzerland, was visited by an earthquake on May 22, which moved from north to south and was plainly felt. Caracas, Venezuela, where so much damage had been done by an earthquake, on October 29, 1900, experienced another shock on June 11, 1901. One or two minor earthquakes occurred in England and Scotland during the summer, but the destruction of a few chimneys was the extent of the damage done. Severe shocks occurred in Erzerum, Armenia, in November.

EAST AFRICA, a general term applied to British, German, and Portuguese East Africa. The total estimated area is about 1,800,000 square miles, and an estimated population of about 15,800,000. See the four articles following and **UGANDA** and **ZANZIBAR**.

EAST AFRICA, BRITISH, a territory extending from the Egyptian Soudan to German East Africa and embracing some 1,120,000 square miles, comprises the East Africa Protectorate and the Uganda Protectorate (*q.v.*), together with the island protectorate of Zanzibar (*q.v.*). Great Britain has no colonies proper in this part of Africa.

EAST AFRICA, GERMAN, a protectorate of Germany extending from the British to the Portuguese East African possessions and from the Indian Ocean to Lake Tanganyika, has an estimated area of 384,000 square miles. According to the official estimate of January 1, 1900, the inhabitants numbered 6,105,000, of whom only 1,139 were Europeans. The largest cities are Dar-es-Salaam (the seat of government), Bagamoyo, Kilwa, Saadani, and Pangani, all on the coast. The protectorate, which is administered by an imperial governor, is not self-supporting, and large imperial contributions are made. The estimated revenue (including imperial subsidy of 6,700,000 marks) and expenditure for the fiscal year 1901 balanced at 9,708,000 marks. For the fiscal year 1902 the revenue was estimated at 46,000 marks less and the imperial subsidy at 1,156,000 marks more. (The mark is worth 23.8 cents.)

Various tropical products are raised. The leading exports are rubber, ivory, and horns, grain, and gum-copal. The German government, though hampered by the *Reichstag*, is making considerable effort to develop the country, but during the last few years trade has steadily declined.

Imports in the fiscal year 1898-99 amounted to 11,852,656 marks, and in 1899-1900, 10,822,586 marks; exports for the two years were valued at 4,332,945 marks and 3,937,150 marks respectively. The stagnation of trade is due in part to lack of transport facilities; for, though a number of good roads have been built from the coast far into the interior, general communication is difficult and the railway mileage is small. The railway from Tonga to Karagwe (54 miles), a large part of which had been in operation for over a year, was completed in the summer of 1901. The survey is being carried on to Mombo, about 28 miles beyond Karagwe. In the fall of 1901 only about 30 miles of the proposed railway from Dar-es-Salaam to Mrogoro had been surveyed. In April, 1901, Count von Bülow, the German imperial chancellor, brought before the *Reichstag* a bill providing for the construction of this line. The proposed line would be built by a German syndicate, on whose capital of £1,200,000 the government would guarantee interest at 3 per cent. Although the chancellor regarded the railway as an absolute necessity, the bill met opposition, and figures were cited purporting to show that the line could not pay. In May, however, the plan for its construction, with some modifications, was recommended by the budget committee; but the final passage of the bill, which did not take place in 1901, was by no means assured. Advocates of a progressive colonial

policy maintain that much valuable time has been lost through "the pettiness of shortsighted colonial politicians."

On February 23, 1901, Baron von Richthofen, the German foreign secretary, and Sir Frank Lascelles, the British ambassador at Berlin, on behalf of their respective governments, signed an agreement fixing the delimitation of the German and British possessions between the northern end of Lake Nyassa and the southern end of Lake Tanganyika. The agreement was based on the proposals of the mixed commission appointed to delimit the boundary in pursuance of the Anglo-German agreement of July 1, 1890. The boundary begins at the mouth of the Kalambo River at Lake Tanganyika, and follows that stream to its confluence with the Samfue stream. The latter constitutes the boundary to its southeastern source, whence the line follows a series of boundary pillars and rivers to the junction of the Katendo stream with the Songwe River, and then follows the latter to its mouth at Lake Nyassa.

EAST AFRICA, PORTUGUESE, a colony of Portugal, extends along the eastern coast of Africa from Cape Delgado to Kosi Bay, touching German East Africa on the north and Tongaland (British) on the south. The estimated area of its two principal districts, Mozambique and Lourenço Marques, and several smaller districts, is 301,000 square miles and the estimated population 3,120,000. The colony is administered by a royal commissioner. There is a military force of about 4,900 men, of whom some 3,250 are natives. The principal imports are cotton goods, iron wares, and alcoholic liquors, and the leading exports include rubber, ores, wax, and ivory. For 1899 the imports and exports were valued at about \$7,785,000 and \$790,000 respectively, while in addition the transit trade amounted to about \$10,925,000. A railway is in operation from Lourenço Marques, on Delagoa Bay, to the Transvaal frontier, 57 miles, and thence extends 290 miles to Pretoria. Another line runs from Beira, near the mouth of the Pungwe River, for 222 miles to Umtali, near the Maslionaland frontier, and thence is continued about 180 miles to Salisbury. In 1901 a railway about 20 miles in length was projected to connect Sao Domingo with the port Quilimane. There are about 950 miles of telegraph line in the colony; Lourenço Marques has telegraphic communication with the Transvaal, and Beira with Cape Town, by way of Salisbury and Buluwayo.

The United States consul at Lourenço Marques, writing in September, 1901, stated that little business could be transacted in the colony before the end of the South African war. The entire transportation system of South Africa, he said, was taxed to its utmost capacity in supplying the troops with rations, munitions, etc., and the ordinary merchandise was allowed to lie for months at the ports. Railway traffic, moreover, was not entirely safe, as trains on the Delagoa Bay railway were occasionally captured and destroyed by the Boers.

EAST AFRICA PROTECTORATE, a British dependency, bordering the Indian Ocean between the Juba and Umba rivers and extending inland to Uganda, has an estimated area of 1,000,000 square miles and an estimated population of 2,500,000. It is not unlikely that the figure given here for area is too large. The protectorate is administered by a British commissioner, Sir C. N. E. Eliot since 1900, who is also British agent in Zanzibar. There are four provinces under sub-commissioners: The Coast Province, Tanaland (including the former small coast protectorate Witu), Ukamba, and Jubaland. The capital is Mombasa (population about 30,000), which is one of the chief cities, and has, perhaps, the finest harbor on the East African coast. This city has telegraphic communication with the coast city Lamu, and also with Europe through cable communication with Zanzibar.

Revenue and expenditure for the fiscal year 1900 amounted to £69,770 and £183,868 respectively. Imports and exports in the fiscal year 1900 were reported at £442,800 and £121,667 respectively; for 1901, £444,142 and £83,959 respectively. The leading imports are cotton goods, rice, grain, flour, and building material, and the chief exports are ivory, rubber, live stock, hides and horns, and gum-copal.

The Uganda Railway, connecting Mombasa with Port Florence on Victoria Nyanza, was begun on December 11, 1895, and completed in December, 1901. The first locomotive reached Port Florence on December 20. According to the original survey of this line, the total length was to be 670 miles; a shorter route, however, was followed, so that the actual length of road constructed at the end of 1901 was 572 miles. The engineering difficulties of this railway, which reaches the lake at an altitude of more than 3,000 feet above sea level, after crossing intervening mountain ranges of twice that altitude and more, were very great and have been little understood. The road was carried through dense forests, through deep cuttings of rock and soil, and over many streams which on account of the sudden and varying rainfall were difficult to bridge. At Mombasa is a bridge connecting with the mainland 1,732 feet in length. The total cost of the line, which has a one-metre gauge, has been estimated at £5,206,000. It is expected that an extension from the present terminus at the lake will be made to Port Victoria, 50 miles distant. It is believed that the railway will serve to develop greatly both the East African Pro-

tectorate and Uganda. The Germans fear, seemingly with good reason, that it will divert traffic from their protectorate, and accordingly have become more urgent in their pleas to the *Reichstag* for railway appropriations.

On November 16, 1900, Mr. Arthur Jenner, sub-commissioner of Jubaland, was murdered by a band of insurgent Ogaden Somalis. A punitive expedition, numbering about 500, under Colonel Trevor TERNAN, was organized at Kismayu, and on February 5, 1901, occupied Afmadu, the headquarters of the insurgents, about 80 miles from Kismayu, and the Ogaden sultan was taken prisoner. It was learned that the sultan's brother and other chiefs who had fled northward were the real culprits. While in pursuit of these the expedition was attacked, on February 16, at Somasa, 57 miles from Afmadu, and lost 17 killed; the enemy, however, were repulsed with a loss of 150. There were several subsequent skirmishes, and about the middle of March the expedition, having suffered severely from great heat and scanty supplies of water, returned to Kismayu for refitting. The expedition returned to the interior and reached a successful conclusion in May, when the chief sultan acquiesced in the payment of a fine for the murder of Mr. Jenner.

It was reported in May, 1901, that severe fighting had also occurred in Tanaland—a province adjoining Jubaland—where some Ogaden Somals, who had emigrated from Jubaland, had plundered and committed various other outrages upon friendly natives and Arabs. A party under the sub-commissioner, Captain A. S. Rogers, defeated the Somalis, taking many prisoners and capturing 5,000 cattle, sheep, and goats.

ECLIPSE CYCLE, STOCKWELL'S, and ECLIPSE, SOLAR. See **ASTRONOMICAL PROGRESS.**

ECONOMIC ASSOCIATION, AMERICAN, organized in 1885; president, Professor E. R. A. Seligman, Columbia University; secretary, Professor Frank Fetter, Cornell University. The largest session of the American Economic Association since its foundation was held in Washington, December 27 to 30, 1901; 150 delegates were in attendance. The annual address was delivered by the president for 1901, Professor Richard T. Ely, of the University of Wisconsin, on *Industrial Liberty*, at a joint meeting of the American Economic and the American Historical associations. Of the various papers read before the Association, those possessing the greatest present interest were *The Meaning of Recent Expansion in the Foreign Trade of the United States*, by Brooks Adams, and *The Commercial Policy of Europe*, by Worthington C. Ford, formerly chief of the Bureau of Statistics, now of the Boston Public Library, upon the general subject of *International Trade*. Mr. Adams contended that the westward movement of civilization is steadily enlarging the diameter of the economic system, disturbing the stability of the social equilibrium, changing the direction of trade routes, and "throwing the ancient capitals into eccentricity. This signifies ruin for the city and annihilation for the population." He also contended that war was an instrument of commercial competition as much as trade, and that this weapon was wielded by the unsuccessful civilizations against those nations which supplanted them in the struggle for economic supremacy, and that therefore an outbreak of war at certain periods of economic development was to be expected. Such a crisis he now considers has arrived—"As with Nineveh so with London. As the volume of American exports has grown, so has the tide of exchanges set more decisively against Great Britain, until her people have literally eaten up the accumulations they once possessed in America." All signs, in Mr. Adams' opinion, point to an imminent world crisis, wherein Europe will unite against the encroachments of the United States. "Unless all experience is to be reversed, the ferocity of the struggle for survival must deepen until one of the two competing economic systems is destroyed. Were all other signs wanting, we can see the shadow of the approaching crisis in the failure of the purchasing power of Europe, which is reflected in our declining exports and in the threats of retaliation which we daily hear."

Mr. Ford's paper was along similar lines. On the basis of an extended discussion of the commercial treaties of Europe, he attempted to show that Russia was deliberately separating herself from her western neighbors, and that western Europe may take similar action against the United States. "There is no doubt that Russia is intent upon shutting out the whole world commercially, and upon destroying the German in its western provinces. One ukase follows the other, and scarcely is one additional duty enforced when another is proposed, for the most part duties which must offend Germany more than any other." The exclusion of the United States from European markets would not be accomplished by any formal alliance against us among European powers, but by "the conscious imitation of regulation by more than one power." The general dread of the increasing encroachments of United States exports might influence the powers of central and western Europe to adopt similar measures to exclude our trade. Mr. Ford considered that the only way in which this calamity could be avoided would be by the adoption of a policy

of reciprocity by the United States. "To conciliate opposition by wise concession is the part of true statesmanship; to offer a better use of our undeniably great resources is the true economic policy of the United States, and this betterment cannot be obtained by wilfully closing the best markets to our products. The tariff should not be an implement of offense, of commercial war, but one of revenue and commercial peace."

Other papers read before the Association were as follows: On "Economic Theory:" *Some Theoretical Possibilities of a Protective Tariff*, by Assistant Professor Thomas N. Carver, of Harvard University; *The Position of the Workmen in the Light of Economic Progress*, by Professor Charles A. Tuttle, of Wabash College. On the "Labor Problem": *The Negro in the Yazoo-Mississippi Delta*, by Alfred H. Stone, Greenville, Miss.; *Conciliation and Arbitration Among Miners*, by Herman Justi, commissioner of the Illinois Coal Operators' Association; *Study of Spanish and American Administrative Methods*, by T. S. Adams, of the University of Wisconsin, late assistant to the treasurer of Porto Rico; and *Report of the committee on uniform municipal accounts and statistics*; and at the second joint meeting with the American Historical Association, *Historical Materialism and the Economic Interpretation of History*, by Professor Seligman. The work of the committee on uniform municipal accounts and statistics of the National Municipal League deserves special attention. The object of the work of this committee is to submit a scheme of municipal accounting which will not only be of service to the taxpayers of those cities which adopt it, by enabling them to understand the methods and results of collection and disbursements, but also enable a comparison of the finances of different cities—a thing impossible in the present confusion of municipal accounts. The committee is largely composed of expert accountants, among them Mr. C. W. Haskins, of Haskins & Sells, New York, and Dr. E. M. Hartwell, of the Boston Statistical Commission. As the plans of the committee develop they are, as far as possible, put into operation in various cities. The system of accounts of Chicago, for example, has been recently reconstructed in this manner by Mr. Harvey S. Chase, of Boston, under the direction of Haskins & Sells. The committee reported that considerable progress had been made, and that in another year they hoped to be able to present a complete scheme to the league, which would then recommend its general adoption by municipalities.

ECUADOR, a South American republic on the Pacific coast, lies between Colombia and Peru. The capital is Quito.

Area, Population, etc.—The area of the 16 provinces and one territory comprising Ecuador has been estimated at 120,000 square miles. There are unsettled boundary disputes with Colombia and Peru. The estimated population is 1,270,000, of whom some 870,000 are Indians. On June 12, 1901, the president approved a law providing for the establishment of a board of immigration, "whose object shall be to attract and encourage foreign immigration, and to found colonies in different parts of Ecuador."

The only church having a legal status is the Roman Catholic. Primary instruction is free and nominally compulsory. In 1898 349,318 sucres were expended for public instruction and 438,848 in 1899.

Government.—The chief executive is a president, assisted by a cabinet, while the legislative power devolves upon a congress of two houses, the senate and the house of representatives. The president for the four-year term ending in August, 1901, was General Eloy Alfaro, a Liberal; he was succeeded by General Leonidaz Plaza, also a Liberal, who was inaugurated at Quito on August 31. The salient features of General Alfaro's administration were the undertaking of the railway to Quito and the curtailment of clerical power in secular affairs.

Finance.—The law establishing the gold monetary standard, enacted in November, 1898, went into effect on November 4, 1900. The unit of value is the sucre, valued at 48.665 cents, or one-tenth of a British sovereign. Revenue is derived chiefly from customs duties, and the largest items of expenditure are service of the debt and appropriations for public works. The revenue and expenditure in 1898 were 7,805,190 sucres and 7,735,710 sucres respectively; in 1899, 7,625,830 sucres and 6,662,945 sucres respectively. Of the revenue in 1899 6,184,632 sucres accrued from customs. The estimated revenue in 1900 was 8,268,100 sucres and the estimated expenditure 8,967,783 sucres. The external debt in 1900 stood at \$693,160 (\$3,373,263), of which bonds amounting to \$676,400 (\$3,291,701) were deposited for exchange into bonds of the Guayaquil and Quito Railway Company. The internal debt has been reported at 7,500,000 sucres.

Industries and Commerce.—Agriculture is the principal industry and the chief product is cacao. The total cacao production in metric tons (2,204.6 pounds) is reported at 21,000 in 1898 and 26,415 in 1899; there was a considerable decrease in 1900. The total imports and exports in 1898 were valued at 9,869,795 sucres and 15,095,145 sucres respectively. In 1899 the exports amounted to 21,410,248 sucres;

figures for the imports are not available, since the records were destroyed by the great Guayaquil fire of November 27, 1899. The imports amounted to 13,431,179 sucres in 1900 and the exports 15,419,222 sucres. In 1900 imports and exports each to the value of over 12,000,000 sucres passed through the port of Guayaquil.

The values of the leading exports in 1900 were: Cacao, 10,700,581 sucres; ivory nuts, 1,400,793 sucres; crude rubber, 1,076,068 sucres; silver bullion and coin, 349,876 sucres; and straw hats, 321,367 sucres. In 1899 the cacao export amounted to 27,703 metric tons, of which 24,072 passed through Guayaquil; in 1900 the export from Guayaquil was 15,846 tons. Of the latter amount 7,302 tons were sent to France, 2,365 to Great Britain, and 2,267 to the United States.

Communications.—The railway from Durán (opposite Guayaquil) to Chimbo, which has been stated to be 58 miles in length, but more recently 67, has been practically rebuilt to conform to the line now under construction from Chimbo to Quito, 219 miles distant. This line is being constructed for the Ecuadorian Association, of London, by the James P. McDonald Company, of New York. The chief engineer and general manager is Mr. John A. Harman. On July 1, 1901, about 5,000 laborers were employed on the work, including about 2,730 Jamaicans, 1,800 Ecuadorians, 305 Barbadians, and 240 Porto Ricans. At that time there were nearly completed from Durán 25 miles of road, and 120 miles were located. The ascent of the Andean plateau will be made in part by the switchback system. The section between Chimbo and Sibamba, 48 miles, presents the greatest engineering difficulties. It was hoped that the railway would be completed to Guamate, 30 miles beyond Sibamba, before the end of 1901. Guamate is a point of much importance, since there roads from the interior converge.

ECUMENICAL CONFERENCE, METHODIST. See METHODIST ECUMENICAL CONFERENCE.

EDDIS, EDEN UPTON, English artist, died in London, April 7, 1901. He was born in 1812, studied art first under Sars, and in 1827 entered the Royal Academy School. He was a medalist of the next year, and for fifty years thereafter exhibited regularly at the Academy. Among his best known canvases are "The Sisters," an illustrative work; "Ruth and Naomi," and "The Raising of Jairus' Daughter." Later in life he achieved a wider fame as a painter of children's portraits, his "Going to Work" being perhaps the most popular.

EDUCATIONAL ASSOCIATION, NATIONAL, held its fortieth annual meeting at Detroit, Mich., in July, 1901. The number of noteworthy papers and addresses was unusually large. Among these were *Isolation in the School*, Dr. W. T. Harris, United States commissioner of education; *Educational Progress of the Year*, Dr. Elmer E. Brown, University of California; *Lessons of the Educational Exhibits at Paris*, Anna Tolman Smith, United States Bureau of Education; *The Ideal School*, Dr. G. Stanley Hall, Clark University; *Progress in Education*, Bishop Spalding; *Social Science and the Curriculum*, Professor George E. Vincent; *English Education*, C. S. H. Breverton. The committee appointed in 1898 to investigate the subject of a national university presented its final report at this meeting, in an admirably clear and concise document, declaring against the proposition of founding a statutory national university of the United States, but offering suggestions of an alternative nature and reviewing the work already accomplished toward that end. The association, however, in receiving the report and discharging the committee made note of the fact that it was not prepared to abandon its previous declarations in favor of a national university. At a later meeting the proposal for a national university was definitely indorsed. (See also **CARNEGIE INSTITUTION FOR RESEARCH**, and the paragraph **National University** in the article, **UNIVERSITIES AND COLLEGES**.) The declaration of principles adopted at the meeting of 1901 is an interesting indorsement of the American system of public instruction, and together with its recommendations for the enlargement of its operations offers an instructive parallel to the principles adopted at the annual conference of Catholic colleges in April. President W. M. Beardshear, of the Iowa State Agricultural College, was elected president of the association for the year 1901-02. Irwin Shepard, Winona, Minn., is the permanent secretary. The active (permanent) membership is nearly 2,500, and the average annual membership about 8,000. The permanent invested fund is \$88,000, yielding an income of about \$3,900.

EDUCATION IN THE UNITED STATES. The present article deals briefly with some of the principal topics of educational interest discussed during 1901. A specific record of the progress of higher education in the United States will be found in the article **UNIVERSITIES AND COLLEGES**.

The University and the Secondary School.—The discussions as to the relation of the university to the secondary school, the question of electives in the secondary school, and the proper basis upon which graduates of secondary schools should be admitted to college—questions which were noted as a prominent feature of Ameri-

can educational thought in 1900—have been even more prominent in the discussions of 1901. Almost half of the articles in the leading American journal on secondary education, *The School Review*, have dealt directly or indirectly with these questions. It is significant that the discussion as to electives has changed entirely within recent years from a discussion as to whether or not the high school course should contain electives to how far the elective system should be allowed. Some of the best articles in the leading educational journals during the year 1901 were upon this question. With the continued discussion of the high school course of study, the question as to what the university has a right to require of the high school has been brought into still greater prominence. One question cannot be considered without the other. From the leaders in secondary education the protest against university dictation has come with increasing force. The idea that a pupil must have four years of Latin, three years of Greek, three years of mathematics, or any number of years of any specific subject, English excepted, in order to be admitted to a university, has seemed so absurd that an increasing number of the larger and more independent secondary schools have asserted their independence and arranged their courses to meet individual and community needs, regardless of university requirements. Many of the leading universities have responded to the demand from the secondary schools and have allowed much greater liberty in the selection of entrance subjects; other universities have resorted to compromise measures; and many others are carefully considering the advisability of a further modification of their entrance requirements. In the changes in entrance requirements made during 1901, an almost uniform tendency toward greater liberality and flexibility is to be noted and it may be confidently asserted that these university changes are a direct result of the discussion as to the province and work of secondary school, which has been so prominent during the past three or four years.

General Progress of the Year.—The year 1901 saw the completion of *The Elementary School Record*, a series of nine monographs describing the work of the experimental school conducted by Dr. John Dewey at the University of Chicago. These form an interesting and valuable record of the work done. The year also saw the union of the Chicago Institute, founded by Mrs. Emmons Blaine, with Chicago University. It was felt by the trustees of both institutions that more good could be accomplished by a union of the two institutions than they could accomplish working separately. The school will in future be known as the Chicago University School of Education. It is understood that the new institution will have an endowment of a million dollars. The Chicago Manual Training School, and the South Side Academy, a private secondary school, have been merged into this new school of education. The new Chicago school thus becomes, in equipment, one of the most prominent institutions in the United States devoted to the professional preparation of teachers and directors of education.

Teachers' College, Columbia University, experienced a wonderful degree of prosperity during the year. The graduate work, organized only four years ago, now outranks the undergraduate work in importance. The year saw the completion of the Horace Mann model school, a magnificent structure built to house a model school of a thousand pupils, and extending from kindergarten to university. A large gift was also received from Mr. and Mrs. James Speyer for the erection of an experimental school in a nearby but less favored portion of the city. This new school will add greatly to the educational resources of the college.

Substantial progress in city school organization was made during 1901. The revised charter for the city of Greater New York, taking effect January 1, 1902, confirms the strong provisions relating to the public-school system which were incorporated in the charter of 1897, and removes some of the defects which a series of compromises had permitted to remain in the earlier charter. Perhaps the most important improvement is the sweeping away of borough school boards, borough superintendents, and borough control of the school, and in their place centralizing the power in the central board of education, providing for a single unified school system for the entire city, and placing a single superintendent in control of the school system. The new school board consists of 46 representatives—22 from the borough of Manhattan, 14 from the borough of Brooklyn, 4 each from the boroughs of the Bronx and Queens, and 2 from the Borough of Richmond. They are to hold office for five years; are to be appointed by the mayor; are exempt from the operation of the general power of removal clause; and a portion are to go out of office each year. The board is to appoint an executive committee of 15, to which extensive powers are to be delegated. It was necessary, in making the change from the old borough plan to a unified city system to concede something to borough sentiment. So it happens that the new board is so large that it is unwieldy, and the delegation of powers to a committee of fifteen—a necessity if business is to be expedited—will doubtless prove a source of trouble, though it will hasten the day when New York will see the necessity of reducing its board of education to a board

of 13 or 15, even, in order that responsibility may be centralized and efficient management secured. The charter provides for the election of a superintendent of schools, a superintendent of school buildings, a superintendent of school supplies, a supervisor of lectures, and eight associate city superintendents, all elected for a term of six years. The board of superintendents is the central administrative body, which has immediate charge of the educational policy of the city and the work of the school system as a whole. This board has large powers and takes the initiative in all important matters. The 26 borough superintendents under the old régime are to become district superintendents. The board of education is to divide the city into 46 local districts, and 23 of the district superintendents are to be given the oversight of two local districts each. These district superintendents are to be given educational but not administrative duties. They are to spend their time in the schools, and are to guide and inspire the teaching force. An innovation in school management, or, more properly, a survival of the old system of district control, is the provision for a local school board for each of the 46 districts of the city, each local board to consist of one member of the central school board, the district superintendent, and three citizens. These district boards are purely advisory and are intended to give voice to local opinion in school matters. They are also calculated to become centres of criticism, though the charter gives them no direct power over the schools, the teachers, or school supplies.

In Chicago the board of education has adopted a provision for free text-books in the primary schools. The chief opposition to the proposal came from the parochial school interests. This, and the meeting of the Association of Catholic Colleges at Chicago in February, 1901, have brought the religious question in education more prominently to the front than before. The year 1884 marked the beginning of a new movement for the establishment of Catholic parochial elementary schools, and since that time the number of such schools has increased rapidly. In 1890 1,000,000 pupils were enrolled and \$25,000,000 were expended, not including colleges or universities. Up to the present the Catholic Church has devoted its energies to the founding of primary and grammar schools, but the Association of Catholic Colleges, at the meeting in February, recommended that in the future especial attention be given to the establishment of high schools. The near future will probably see a well-developed system of Catholic education.

In San Francisco the new charter provisions for the management of the schools are growing more and more unsatisfactory, as it was freely predicted in advance that they would. The paid board, which started out well, seems to have lost control of the situation, and the open rupture with the superintendent, who is a county official elected independently of the board, has weakened public confidence. Until San Francisco can subordinate the superintendent to the board of education, there is little hope for harmony or efficient school control.

A new development in the education of Cuban teachers took place during the year 1901. After some investigation the Cuban authorities selected the State Normal School at New Paltz, N. Y., as the best available place for the education of Cuban teachers, and has sent 80 young girls to this school for a full course of instruction, to cover a period of two or more years. These students are paid \$20 a month while studying, and the Cuban government pays the State of New York for their education. When they have completed their course of instruction, a course that has been especially arranged to meet Cuban needs, they are to return to Cuba and be given responsible positions in the schools. The New Paltz authorities have taken up the problem with great earnestness, and this experiment promises to be one of the most interesting and most successful ever attempted.

The Association of American Universities held its second meeting at Chicago in February, 1901, and made substantial progress, as reported in the *Educational Review* for April, in its work looking toward the unification of American university work for the higher degrees. The Yale bi-centennial celebration of October 20-23, was a most notable event, and called forth a number of valuable magazine articles, one of the most interesting being *The Yale Curriculum, 1701-1901*, by Professor John C. Schwab, in the *Educational Review* for June. The Detroit meeting of the National Educational Association in July was one of the most noteworthy in the history of the Association, both in point of numbers and in the value of the papers read. The active membership of this association reached 2,820 in 1901, having almost doubled in five years. The report of the secretary as to the wonderful growth of this great voluntary association of teachers is one of the most interesting features of the volume of *Proceedings for 1901*.

For agricultural education, see the paragraph on that topic under AGRICULTURE.

Education in the Insular Possessions.—The report of the Philippine commission shows very substantial progress in providing education for the Filipino children. An education bill was enacted and \$1,500,000 were voted out of the insular revenues for the support of schools. A normal school has been established

at Manila; schools have been organized in most of the provinces that have been reduced to order; and about 600 superior teachers have been taken to the islands from the United States. In Cuba great progress has been made. The census taken in 1899 showed that 63.9 per cent. of the population were unable to read, and only 200 schools in the island. At present there are over 5,000 teachers at work, and the number is rapidly increasing. Hawaii has long had an excellent system of schools. The last report of the minister of public instruction that is available shows an enrollment of 15,490 pupils. It is only from Porto Rico that very recent statistics are at hand. In a letter written toward the close of 1901 the commissioner of education for the island writes as follows: "We maintain school in Porto Rico nine months. Our average daily attendance for the past year has been 75 per cent.; only 1 per cent. lower than Massachusetts. Under the military government there were 612 schools; May 1, 1900, there were 800 schools; and September 30, 1901, there were 1,000 schools. A year ago there were less than 100 American school desks here. We have put in 7,000 the past year, and during the present year will add 7,500 more. In January, 1901, we had not one schoolhouse of our own in Porto Rico. We now have 18 agricultural schoolhouses and 8 more in process of erection; and 18 four-room brick graded schools, 1 six-room school, and 3 two-room schools will be ready by October 1, 1901. An insular normal school will be ready by November 1. The value of permanent equipment added in six months is \$265,000. We have petitions for more schools daily—the demand greatly exceeds supply. Our limit is money. We have \$500,000 in this year's budget for schools, which is 25 per cent. of all insular funds. This represents only our financial, not our educational, growth. We could have voted \$1,000,000 and had support from public sentiment. But we knew our financial limits. The main objection to the budget was that the school fund was too small. We have 55 pupils in many schools, and as many as 124 in some places on waiting lists. Spain had but few schools—only one in terms. The poorer communities never had a school. We have now opened over 600 rural schools."

Literacy of Adult Population in the United States.—As shown by the returns of the census taken in 1900, there were in the United States at that time 21,329,819 males of voting age, of whom 10,636,898 were natives born of native parents, 3,466,721 were natives born of foreign parents, while 4,932,524 were foreign whites and 2,065,989 were negroes. Of the natives born of native parents, 5.8 per cent. were illiterate; of the natives born of foreign parents, 2 per cent. were illiterate; of foreign whites 11.5 per cent. were illiterate, and of negroes 47.3 per cent. were illiterate. Chinese, Japanese, and Indians not included in the above summary were illiterate to the following extent: Chinese, 31.3 per cent.; Japanese, 33.9 per cent., and Indians, 65.1 per cent. From this it is seen that of all the elements of population in the United States, the negroes, with the exception of the Indians, whose number is comparatively so small as to be of little practical importance, are by far the most illiterate. The table on the opposite page gives for each State and Territory the total number of males of voting age by classes, and the degree of illiteracy of each class. A more detailed statement of the comparative literacy of negroes in the various States will be found under the article **NEGRO PROBLEM**. With regard to the comparative literacy of other elements of the population, it is very difficult to make deductions from the returns given by the census and tabulated below, for the reason that discrepancies between the States are so large as in many instances to seem unaccountable. In general, however, it will be noted that wherever the foreign population is very large, either numerically or in proportion to the total number of inhabitants, the degree of illiteracy is correspondingly large. Thus Massachusetts, which is generally spoken of as the foremost State educationally in the Union, has an adult male foreign population exceeding its strictly native population; and while the illiteracy of the natives is only 0.6 per cent., the illiteracy of the foreign whites is 13.8 per cent., a larger average than that for the entire country, including the undeveloped and mining States, where education is somewhat backward. The southern States very commonly show a comparatively large proportion of illiterates for both native and foreign population, and this high ratio is the more significant, since the large bulk of the illiterate negroes are also located there. Speaking broadly, it will be observed that illiteracy tends to decline in the rural sections of the country, especially those sections where small agricultural holdings are the rule; and where those same States show a large number of foreign whites and a proportionately large degree of illiteracy among them, it may often be safely assumed that these foreigners have been drawn to the State either on account of mining or mechanical industries or to work on extensive farms and ranges. Considering the comparative illiteracy of the different elements of the population, the States apparently most in need of more schools are Louisiana, New Mexico, and some of the southeastern States.

LITERACY OF ADULT POPULATION IN THE UNITED STATES.

STATES AND TERRITORIES.	NATIVES BORN OF NATIVE PARENTS.		NATIVES BORN OF FOREIGN PARENTS.		FOREIGN WHITES.		NEGROES.	
	Total number males of voting age.	Per cent. of illiteracy.	Total number males of voting age.	Per cent. of illiteracy.	Total number males of voting age.	Per cent. of illiteracy.	Total number males of voting age.	Per cent. of illiteracy.
The United States	10,636,898	5.8	3,466,721	2.0	4,992,524	11.5	2,065,989	47.3
Alabama	216,080	14.2	8,162	3.5	8,082	8.0	181,471	59.5
Alaska	15,146	0.5	2,855	1.1	7,952	6.0	141	4.3
Arizona	16,183	3.3	6,567	7.5	12,161	30.9	1,084	11.1
Arkansas	206,967	10.8	9,352	4.8	8,278	6.4	87,157	44.8
California	201,584	1.1	107,667	1.2	180,294	8.1	3,711	14.6
Colorado	99,563	2.8	30,891	1.2	51,162	7.1	3,215	13.9
Connecticut	113,768	0.9	54,965	1.2	106,403	15.6	4,576	13.1
Delaware	38,567	8.0	5,575	1.7	6,747	17.6	8,374	42.7
District of Columbia	39,557	1.0	11,161	0.7	9,600	5.0	23,072	26.1
Florida	63,272	8.6	4,965	3.9	9,725	9.2	61,417	39.4
Georgia	263,929	12.1	6,860	2.4	6,707	5.6	223,073	56.4
Hawaii	11,314	5.9	1,562	2.0	6,700	39.3	93	31.2
Idaho	25,786	1.1	11,051	1.0	13,491	5.7	130	15.4
Illinois	586,773	3.6	316,313	1.3	467,123	7.8	29,762	18.7
Indian	517,446	4.8	111,228	2.6	73,067	9.6	18,186	27.7
Indian Territory	71,736	10.9	3,186	6.0	2,943	16.8	9,146	41.3
Iowa	321,513	1.8	151,246	1.2	157,906	5.2	4,441	22.0
Kansas	268,688	1.7	62,926	1.4	66,938	6.4	14,695	18.1
Kentucky	402,244	15.5	41,823	2.8	25,139	8.6	74,728	49.5
Louisiana	121,356	20.3	31,182	8.6	25,340	24.6	147,348	61.3
Maine	157,377	2.2	20,964	10.0	38,515	21.4	445	17.3
Maryland	172,003	5.9	46,965	2.1	42,011	10.7	60,406	40.5
Massachusetts	320,943	0.6	165,584	1.5	343,522	13.8	10,456	10.5
Michigan	288,293	2.2	162,537	2.7	261,415	10.2	5,193	14.0
Minnesota	104,577	0.7	137,054	1.3	260,763	6.4	2,168	6.9
Mississippi	140,056	8.3	5,750	4.1	4,715	9.5	197,936	63.2
Missouri	551,438	6.3	145,876	2.1	112,463	6.8	46,418	31.9
Montana	36,130	0.7	19,760	0.9	39,963	6.7	711	10.4
Nebraska	147,506	1.1	59,384	0.9	90,925	5.1	2,298	11.6
Nevada	5,431	0.8	3,424	0.7	5,797	7.0	70	22.9
New Hampshire	82,383	1.4	13,496	5.2	34,769	24.0	230	14.8
New Jersey	224,644	2.8	111,508	1.2	196,596	13.4	21,474	13.3
New Mexico	39,171	24.5	4,382	15.3	7,251	30.9	775	16.3
New York	782,487	1.9	533,096	1.5	829,474	12.1	31,425	11.3
North Carolina	264,601	19.0	2,211	5.7	2,451	5.7	127,114	63.1
North Dakota	19,777	0.8	17,902	1.2	55,568	6.3	115	16.5
Ohio	697,956	3.7	256,955	1.8	225,688	9.6	31,235	21.8
Oklahoma	82,956	2.8	9,990	2.2	8,597	6.3	4,827	32.0
Oregon	79,220	1.1	20,555	1.0	31,486	3.4	580	9.5
Pennsylvania	964,751	2.7	313,928	1.9	484,803	20.2	51,668	17.5
Rhode Island	44,893	1.2	25,340	3.3	53,768	18.2	2,765	15.4
South Carolina	124,097	12.6	3,299	2.1	2,979	5.2	162,860	64.7
South Dakota	36,381	0.6	26,526	1.0	45,446	4.9	184	16.3
Tennessee	353,621	14.5	11,916	3.7	9,509	7.7	112,236	47.6
Texas	458,863	5.3	55,325	10.6	85,773	25.4	136,875	45.1
Utah	18,321	1.6	22,478	0.9	24,406	4.6	358	4.7
Vermont	66,867	2.6	18,324	10.1	20,846	23.3	289	19.7
Virginia	280,881	12.5	9,413	2.9	11,085	10.5	146,122	52.5
Washington	92,262	0.5	29,992	0.6	61,745	3.9	1,230	11.5
West Virginia	205,216	11.2	15,035	3.7	12,878	22.5	14,786	37.8
Wisconsin	116,943	1.5	192,966	2.1	267,304	9.3	1,006	12.7
Wyoming	18,012	0.9	7,639	0.6	10,611	7.8	481	21.2

Statistics.—The development of public education in America in the past ten years has been remarkable. Though the population has increased only about one-fifth, the expenditure for common schools has almost doubled. 1889-90 the expenditure for common schools was \$140,506,715; in 1899-1900 it was \$213,274,354, and in 1900-01 it was close to \$220,000,000. The increase in the length of the school term and the number of days the average child attended school has been marked. Counting a year of schooling as 200 days, the entire number of years of schooling received by the average child of the population, counting all public and private education, of whatever grade, has been as follows: 1800, 0.41 year; 1840, 1.04 year; 1850, 2.25 years; 1860, 2.17 years; 1870, 3.36 years; 1880, 3.96 years; 1890, 4.46 years; 1900, 4.99 years. The school enrollment has doubled since 1870.

Attendance in, and Expenses of, Public Schools.—The statistics of the attendance of pupils in the public schools of the United States and the expenses incurred for these schools, as prepared by the commissioner of education for the school year ending June 30, 1900, exhibit several interesting results. Dividing the States into the five main groups given in the table below, that is, into the North Atlantic, South

Atlantic, South Central, North Central, and Western divisions, it appears that the total population of these groups, as given by the census in 1900, was: North Atlantic, 20,988,795; South Atlantic, 10,400,937; South Central, 13,568,457; North Central, 26,262,408, and Western Division, 4,052,086. Now, on the basis of these respective populations, it would be expected that, except in the North Atlantic States, where there are many more private schools than in any other section of the country, the average attendance of pupils and the total expenditures incurred for public schools would be in about the same ratio as the total population in the several sections. Such, however, is not the case. For considering the total expenditures for public schools, which, on the whole, probably gauges fairly accurately the actual efficiency and amount of education offered, it is seen that the North Atlantic Division, with a total population of nearly 21,000,000, expended in 1900 \$83,500,000 for schools, while the North Central Division, with a population of 26,000,000, expended less than \$1,500,000 more. On the other hand, the South Atlantic and South Central divisions, with a combined population exceeding that of the North Atlantic Division and only 2,000,000 less than the population of the North Central Division, expended together only \$28,500,000, or about one-third of the amount expended in either the North Atlantic or North Central Division. On the other hand, the Western Division, with a population considerably less than one-half of the South Atlantic Division, expended \$16,500,000, or more than either the South Atlantic or South Central Division. If the figures of school expenditure for the States of the South Atlantic and South Central divisions are considered more in detail from the figures given below, it will be noticed that, speaking broadly, and therefore, inaccurately, the amount of expenditure per capita for schools tends somewhat to vary inversely in accordance with the negro population of the State. That is to say, in States like North Carolina, South Carolina, and Alabama, where the industrial system depends largely upon negro labor, and where manufactures have not yet entered to a considerable extent, as they are tending to do in West Virginia, the amount of money expended *per capita* for public schools is smaller than in other southern States which are recovering from the effects of the Civil War and the reconstruction period.

The estimated number of children between 5 and 18 years of age in the five divisions of States is as follows: North Atlantic Division, 5,328,300; South Atlantic Division, 3,542,890; South Central Division, 4,705,410; North Central Division, 7,692,680; Western Division, 983,770. Of these pupils the total enrollment in the school year ending June, 1900, was 15,341,220, divided as follows: North Atlantic Division, 3,633,240; South Atlantic Division, 2,174,083; South Central Division, 2,912,698; North Central Division, 5,823,019; Western Division, 798,180. The actual average daily attendance throughout the school year was 10,389,407, or about two-thirds of the enrollment, and less than one-half of all the children of school age. The daily attendance has been given in the table below instead of the enrollment, which is more usually given, from the belief that the daily attendance and not the nominal enrollment is the real basis from which to draw inferences regarding the facts and needs of the educational system of the United States. The average number of days during which schools were kept during the year was 144.6 for the United States, and for the several divisions making up this average, as follows: North Atlantic, 177.1; South Atlantic, 112; South Central, 99.7; North Central, 155.6; Western Division, 145.7. At the same time the average number of days attended by each enrolled pupil during the year was 99.1 for the United States, and for the several divisions was as follows: North Atlantic, 128.3; South Atlantic, 68.3; South Central, 66.6; North Central, 108.7; Western Division, 99.2. The larger average attendance of pupils in the North Atlantic Division is probably due not only to the excellence of the school system in those States, but also to the larger number of schools, and more especially to the shorter distances which pupils have to travel. The reverse of these conditions also largely accounts for the slight attendance in southern schools; but here it should be borne in mind that the finances of many of the southern States have never been on a stable basis since the great debts incurred in the reconstruction period, although earnest efforts have been made lately to lengthen the school term.

The subjoined table, compiled from figures made public by the commissioner of education, shows (1) the estimated number of children in the United States in 1900 between 5 and 18 years of age, (2) the actual average daily attendance in all public schools of the United States for the school year ending in June, 1899, (3) the actual average attendance for the year ending June, 1900, (4) the average length of school terms in the year 1899, (5) the average length of school terms in 1900, (6) the total expenditure incurred for public schools in 1899, and (7) the total expenditure incurred in 1900.

For statistics concerning public and private high schools, universities, and colleges, normal schools and professional schools, see articles SCHOOLS, UNIVERSITIES AND COLLEGES, NORMAL SCHOOLS, and PROFESSIONAL SCHOOLS.

STATES AND TERRITORIES.	Estimated number of children 5 to 18 years of age, 1900.	Average daily attendance, 1899.	Average daily attendance, 1900.	Average duration of school, in days, 1899.	Average duration of school, in days, 1900.	Total expenditure, 1899.	Total expenditure, 1900.
North Atlantic Division—							
Maine.....	170,860	97,706	97,697	126	141	\$ 1,513,125	\$ 1,712,795
New Hampshire.....	90,910	47,733	47,733	135.3	135.3	1,061,265	1,061,265
Vermont.....	84,730	48,014	47,020	156	156	974,611	1,074,222
Massachusetts.....	641,500	360,317	366,136	188	189	13,889,838	13,826,243
Rhode Island.....	102,250	46,087	46,087	187	187	1,570,895	1,570,895
Connecticut.....	213,800	109,951	111,564	189.15	189.01	3,120,516	3,189,249
New York.....	1,786,000	849,430	857,488	177	175	28,062,565	33,431,491
New Jersey.....	478,960	200,278	203,003	185	185	5,723,424	6,142,530
Pennsylvania.....	1,759,300	858,177	854,640	160.6	166.6	20,308,769	21,476,995
South Atlantic Division—							
Delaware.....	48,370	22,693	22,693	160	160	275,000	275,000
Maryland.....	345,350	132,685	132,685	188	188	2,912,527	2,912,527
District of Columbia.....	70,760	34,032	35,463	179.5	181	1,148,850	1,228,133
Virginia.....	626,210	203,136	203,136	119	119	1,971,264	1,971,264
West Virginia.....	322,390	159,768	151,264	111	106	2,046,623	3,215,321
North Carolina.....	669,530	207,310	206,918	68.3	70.8	981,143	981,143
South Carolina.....	497,760	194,418	201,295	83.1	88.4	769,815	894,004
Georgia.....	786,920	265,480	298,237	116.9	112	1,937,954	1,980,016
Florida.....	175,610	74,004	75,008	104	93	668,242	765,777
South Central Division—							
Kentucky.....	673,520	308,697	308,697	115.4	115.4	2,650,190	2,650,190
Tennessee.....	601,570	352,734	338,566	89	96	1,628,313	1,751,047
Alabama.....	652,930	341,138	297,805	100	78.3	800,273	923,464
Mississippi.....	558,800	228,900	201,593	101.6	105.1	1,165,840	1,306,186
Louisiana.....	470,350	146,323	146,323	120	120	1,126,112	1,135,125
Texas.....	1,070,000	370,055	393,780	111.5	108.2	4,476,457	4,469,014
Arkansas.....	468,020	186,177	195,401	70	77.5	1,292,463	1,369,810
Oklahoma.....	120,210	54,600	63,718	96.3	95.3	596,492	666,095
North Central Division—							
Ohio.....	1,179,600	613,337	616,365	165	165	12,671,798	13,335,211
Indiana.....	743,330	424,725	429,566	144	152	8,188,069	8,188,069
Illinois.....	1,362,700	726,782	737,576	159.6	152	17,660,606	17,767,145
Michigan.....	661,940	350,000	350,000	161.8	161.8	5,863,369	6,539,146
Wisconsin.....	618,290	287,000	309,800	160	160	5,132,063	5,493,370
Minnesota.....	506,770	237,145	243,224	159	169	5,172,110	5,630,013
Iowa.....	662,520	364,409	364,409	158	158	7,978,000	7,978,060
Missouri.....	966,400	416,364	460,012	141	144	7,048,826	7,816,050
North Dakota.....	87,130	41,155	43,560	122	155.7	1,288,031	1,440,892
South Dakota.....	117,610	69,923	68,000	111.3	129.1	1,605,623	1,598,757
Nebraska.....	321,800	169,424	181,874	134	135	3,815,593	4,403,222
Kansas.....	464,590	256,934	261,783	124.3	126.225	3,991,477	4,622,364
Western Division—							
Montana.....	43,950	23,400	24,100	140	140	776,150	854,069
Wyoming.....	19,740	8,700	10,160	110	110	213,291	263,551
Colorado.....	118,750	69,065	73,291	166	149.8	2,281,718	2,793,648
New Mexico.....	54,820	17,400	22,433	96.6	96.6	154,532	343,429
Arizona.....	31,240	9,396	10,177	125.8	125	238,741	299,730
Utah.....	89,810	52,208	50,595	151	151	991,973	1,073,586
Nevada.....	9,260	4,982	4,698	154	154	208,642	224,622
Idaho.....	43,780	23,541	21,962	100	106	274,377	400,043
Washington.....	108,660	64,192	64,192	148	148	1,795,795	1,795,795
Oregon.....	111,490	61,234	64,411	123.9	116.6	1,159,125	1,594,430
California.....	362,270	203,248	197,395	163.6	166.2	6,164,053	6,909,351
Recapitulation—							
North Atlantic Division.....	5,328,300	2,617,693	2,631,368	174	177.1	\$ 76,205,008	\$ 83,465,675
South Atlantic Division.....	3,542,890	1,293,526	1,326,684	112.6	112	12,061,418	14,173,185
South Central Division.....	4,705,410	1,983,624	1,945,883	108.2	99.7	13,736,140	14,290,931
North Central Division.....	7,692,680	3,957,198	4,066,169	152.2	155.6	80,425,645	84,802,319
Western Division.....	983,770	537,366	543,414	148.7	145.7	14,253,392	16,542,244
United States.....	22,253,050	10,389,407	10,513,518	143.2	144.6	\$197,281,608	\$213,274,354

New Books.—A few of the more notable new books published during 1901 are *School Hygiene*, by Edward R. Shaw (N. Y.); *Source Book on the History of Education for the Greek and Roman Period*, by Paul Monroe (N. Y.); *Pestalozzi*, by A. Pinloche (N. Y.); *College Administration*, by Chas. F. Thwing (N. Y.); *Notes on Child Study*, by Edward L. Thorndike (N. Y.); *Student Life and Customs*, by H. D. Sheldon (N. Y.); *The New Basis of Geography*, by Jaques W. Redway (N. Y.); *Teaching of Latin and Greek in the Secondary School*, by Charles E. Bennett and George P. Bristol (N. Y.); *The Teachers College Record*, Vol. II. (N. Y.); *The Elementary School Record* (Chicago); *Classified Bibliography of*

Books on Education in the Libraries of Columbia University (N. Y.); and the republication of *Barnard's American Journal of Education*, 31 vols. (Syracuse, N. Y.).

EDWARD VII., KING OF GREAT BRITAIN AND IRELAND, who succeeded to the throne Jan. 23, 1901, upon the death of Queen Victoria, was born Nov. 9, 1841. His early education was carried on by tutors, under the supervision of his father, the Prince Consort, and afterward he studied at the universities of Edinburgh, Oxford, and Cambridge. In 1860, as Prince of Wales, he visited Canada and the United States. Two years later, accompanied by Rev. (afterward Dean) A. H. Stanley, he made a tour of the East, including the Holy Land. On March 10, 1863, the Prince was married to the Princess Alexandra, eldest daughter of Christian IX., king of Denmark; six children were born to them, of whom the Duke of York, now Prince of Wales and heir apparent to the throne, is the second. He was born June 3, 1865. Prince Albert Edward visited India in 1875, and in 1885 he made a trip through Ireland. During his long experience while Prince of Wales, as the personal representative of Queen Victoria, he displayed unusual tact and balance. Shut off from active participation in political life, he turned with enthusiasm to the task of building up a brilliant court circle, and won for himself in time the title of "social umpire." He was interested in horses, owning many famous racers; he was attracted by all out-door sports, and he lived as a man of the world. As prince he was invariably genial, and his personal popularity did not suffer on account of his devotion to sport and society. Beyond this, he has proved himself a man of sound common sense. The duties that have belonged to him he has discharged promptly and well. Much public speaking has fallen to him, as presiding officer at public dinners, at the opening of hospitals and public institutions, and as chairman of committees. The impression he produced on these occasions has been summed up in these words: "He speaks directly and to the point. He never obtrudes himself between the audience and the business of the occasion. He never uses the wrong word, and he never says a word too much. He puts as little of himself as possible into his speeches, and while there is always a firm and manful tone about him, there is never any indication whatever of a desire to impose himself and his position on his audience." Another writer, speaking of his diligence as a member of important committees, says: "As a chairman of a committee, every one agrees that he is admirable. . . . In such institutions as the Royal Agricultural Society, of which he is a member, he has set an example to other members for the painstaking care with which he attends their meetings and participates in their discussions." Other institutions in which, as Prince of Wales, he took an active interest, were the Imperial Institute and the Royal College of Music; and he was a member of the Royal Commission for the Housing of the Poor, and the Commission for the Treatment of the Aged Poor. As king, Edward VII. has shown the same conservatism and balance of judgment which characterized his earlier career. He has not interfered with the policy of his ministers, but has followed scrupulously the principles of government established by Victoria. For the United States the king has already exhibited a friendly interest, an interest which developed during his years of intercourse with many Americans while heir-apparent.

EDWARDS, ARTHUR, D.D., American religious editor, died in Chicago, March 20, 1901. He was born in Ohio in 1834 and graduated at the Ohio Wesleyan University in 1858, commencing his career as a Methodist preacher in the same year. He served through the Civil War as chaplain of a Michigan regiment, and later as a colonel of cavalry, and at its close became assistant editor of the *North-western Christian Advocate*. In 1872 he became editor-in-chief, and as such achieved prominence in religious circles. He was a delegate to six general conferences of his church, and an active member of the Ecumenical Conference in London, 1881.

EGYPT, a state of northeastern Africa nominally under the suzerainty of Turkey, but practically under the influence and protection of Great Britain. The capital is Cairo.

Area, Population, and Education.—The estimated area of Egypt proper—that is, the territory north of the 22d parallel—is about 400,000 square miles; the cultivated and settled area, however, amounts to only about 13,000 square miles. The census of June, 1897, showed the population to be 9,734,405, of whom 573,974 were nomads. Cairo had 570,062 inhabitants, and Alexandria, the chief commercial centre, 319,766. Of the total population, about 92 per cent. is Mohammedan. There are many government, Coptic, and Mohammedan schools. In his annual report published in 1901, Lord Cromer, the British financial adviser, stated that it is unwise to encourage purely academic instruction. He said that the desire for government positions, for which there are already too many applicants, had created too great a tendency to literary education; and since the demand for craftsmen and artisans, as well as engineers, skilled agriculturists, etc., is greater than the supply, he was determined to encourage technical instruction—such instruction, of course, involving a good primary education.

Government and Finance.—The head of the government is the khedive, Abbas Hilmi, who ascended the throne in January, 1892. The heir-apparent is Prince Mohammed Abdul Mouneim, who was born February 20, 1899. The final legislative authority is vested in the khedive and his ministers. The khedive has a yearly allowance of £100,000. The annual tribute paid to Turkey amounts to about £660,000.

Since 1883 Lord Cromer has been financial adviser to the Egyptian government. Although he is not recognized as an executive officer and has the title of consul-general, he is practically governor-general of the country, and without his consent no financial measures can be enacted. The chief sources of revenue are the land tax, the tobacco monopoly, customs, and railways; the largest items of expenditure are service of the debt and internal administration. The revenue and expenditure in 1899 were £E11,200,303 and £E9,929,442 respectively; in 1900, £E11,447,095 and £E9,895,224. (The Egyptian pound is worth \$4.9076.) The figures for revenue here given are exclusive of balances from preceding years. Such surplus in 1900 amounted to £E1,552,000; of this sum £E559,000 belonged to the Egyptian government, £E666,000 were paid to the general reserve fund, £E265,000 (saving effected by conversion economies) were paid to the economies fund, and £E62,000 were paid to the sinking fund. These figures show in the Egyptian revenue an elasticity that "bears eloquent testimony to the success of Lord Cromer's administration." In his annual report he called attention to the fact that, while in the four-year period from 1883 (the beginning of British occupation) to 1886 the aggregate deficit amounted to £E2,606,000, during the fourteen years from 1887 to 1900, inclusive, the aggregate surplus reached the sum of £E9,986,000. This improvement in the public finance was effected "in spite of large reductions of taxation [£E203,000 of land tax were remitted in 1900 on account of the low Nile], of heavy expenditure upon public works, and latterly of a heavy charge on account of the Soudan, amounting for last year to over £400,000." The estimated revenue and expenditure for 1901 were £E10,700,000 and £E10,636,000 respectively. According to the budget for 1902 the estimated revenue is £E11,060,000, and the expenditure £E10,850,000. If to this surplus of £E210,000 be added the several sums for amortization of the debt, the real excess of receipts would amount to £E944,000. Various economies are effected in the army, pension, and other expenses, and it is proposed that the savings thus realized be used for various reforms and administrative improvements. This budget is "the most satisfactory one hitherto produced, affording a striking proof of the great increase in the country's prosperity during recent years." The consolidated debt in 1900 amounted to £E103,049,040.

In Egypt, as in all oriental countries, the money lenders constitute a large non-productive class. To protect the fellahen from extortionate rates of interest, the government carries on, as an experiment, a loan system at 10 per cent. The working out of such a system has been attended with difficulty, partly because of the unintelligent opposition of the fellahen to any innovation, and partly because of the natural difficulty of securing payment from an irresponsible peasant class. Considerable success, however, has been achieved in the plan adopted, which, in general, is that the banks lend and the government collects. To push the business the banks employ agents, who receive 1 per cent. commission, and honesty in the drawing up of contracts is insured by the supervision of English inspectors. The loans are paid, usually in installments, along with the ordinary taxes, to the government tax collectors. The banks assume all risks, which, with the method of governmental collection, do not seem to be very great.

Army.—The Egyptian army has a total strength of about 15,500. The annual cost for maintenance is nearly £E440,000. The commander-in-chief is a British officer, called the sirdar. This officer, since December, 1899, has been General Sir Reginald Wingate. The British army of occupation numbers about 4,500 men; for the maintenance of this force the Egyptian government makes an annual appropriation of £E87,000. There is no effective navy.

Industries and Commerce.—Agriculture, made possible by the Nile overflow, is the principal industry, and cotton, sugar, and cereals are the leading crops. In 1886 the cotton production, in cantars (99.049 pounds), amounted to 2,923,450; in 1890, 3,183,000; in 1900, 6,509,645. In the foreign trade, imports and exports, exclusive of specie, have been respectively: 1898, £E11,033,219 and £E11,805,179; 1899, £E11,441,802 and £E15,350,908; 1900, £E14,112,370 and £E16,766,609. The leading imports in 1900 were: Cotton textiles, £E1,987,095; metals and metal wares, £E1,817,971; cereals, vegetables, etc., £E1,532,341; animals and animal food products, £E652,357; tobacco, £E577,203. The most important exports for the same year were: Raw cotton, £E13,039,003 (4,868,596 cantars); and cereals, vegetables, etc., £E2,615,433. Trade with countries commercially the most important was as follows in 1899 and 1900:

IMPORTS TO EGYPT.

EXPORTS FROM EGYPT.

	1899.	1900.		1899.	1900.
Great Britain.....	£E4,334,026	£E5,300,447	Great Britain.....	£E8,227,275	£E9,141,932
Turkey.....	1,643,224	2,220,966	France and Algeria..	1,366,777	1,430,153
France and Algeria.....	1,060,341	1,314,869	Russia.....	1,255,329	1,309,563
Austria-Hungary.....	735,295	900,958	Germany.....	578,908	900,824
Italy.....	558,871	661,347	Austria-Hungary.....	579,001	642,477
Russia.....	430,023	608,901	Italy.....	445,499	601,496
Belgium.....	626,405	494,751	Turkey.....	339,821	290,193
Germany.....	350,204	465,933	Belgium.....	59,258	121,165

Communications.—At the beginning of 1901 there were in Egypt, exclusive of the Soudan military railway, 1,393 miles of rails owned by the state and 670 miles of rails (light agricultural lines) owned by private companies. The total receipts from the state railways in 1900 were £E2,158,878 and the working expenses £E971,495. The military railway extends to Khartum, 1,331 miles from Cairo. The state telegraph lines at the beginning of 1901 had a length of 2,106 miles with 9,440 miles of wire. See SUEZ CANAL.

Arabi Pasha.—In December, 1900, the British government, and in May, 1901, the khedive, pardoned Arabi Pasha, the ostensible leader of the revolt of 1882, who was exiled to Ceylon after the British occupation. His return to Cairo on September 30 was not regarded as having any political significance, since it is now believed that Arabi was a man of no great ability, having been in fact little more than a puppet in the hands of men like Mahmud Sami and Ali Roubi. He had become, indeed, a pathetic figure; for the nineteen years of exile had transformed the violent revolutionist into an unambitious old man, content with British rule. He acknowledged that England had given to Egypt all that he himself fought for. Accordingly he provoked the indignation of the anti-British party. The following statement from the *Egyptian Gazette* is indicative of the spirit in which this party received him: "He is met by a chorus of groans from the ignorant and of curses from those whose interest lies in stirring up and maintaining agitation against the British occupation."

For Egyptian archæology, see the article ARCHÆOLOGY (paragraph Egypt).

Egyptian Soudan.—The Egyptian Soudan, which extends from the 22d parallel of latitude southward to Uganda, and is bounded on the east by the Red Sea, the Italian colony of Eritrea and Abyssinia, and on the west by the French Sahara and French Congo, was in a comparatively peaceful state during 1901. The last of the khalifa's generals, Osman Digna, had been overthrown in 1900, and no further opposition from the Dervishes to the English administration presented itself. The main efforts of the administration, at the head of which is the sirdar and governor-general, Sir Reginald Wingate, with Sir Rudolph Slatin as inspector-general, were directed toward the rehabilitation of communications and industries in the territory. For administrative purposes, the Soudan is divided into six first-class provinces, Khartum, Dongola, Berber, Kassala, Sennar, and Kordofan, and in three second-class provinces, Wady Halfa, Suakin, and Fashoda. Ashanan was incorporated September 9, 1900, with Egypt. Military governors have been appointed over each of these provinces. Both the revenues and expenses of the Soudan for 1901 increased; the revenues amounted to £E187,500, an increase of £E29,000 over the revenues of 1900; the expenses for 1901 amounted to £E604,679, an increase of £E29,000 over the similar item in the budget of 1900. The deficit of £E417,179, which is about the same as the deficit of 1900, was made up by Egypt. The extra revenue was spent mainly in developing the country. The most important operation undertaken by the government was the clearing of the Nile of the compact mass of sudd which had choked the river and checked communication. The operation of cutting out this sudd was begun in 1900, and the last block was taken out in 1901, so that the river is now clear to Gondokoro. It is expected that much of the trade of the Congo State will pass up the Nile on its way to Europe.

In August Sir W. E. Garstin, who had been sent to inspect communications and also to inspect the headquarters of the Nile with a view to deciding upon the feasibility of damming one of the great sources of this river so as to produce a constant reservoir for irrigation, made his report, and this was published as a Blue Book. After examination of Victoria Nyanza and Albert Nyanza on the White Nile, and Lake Tsana on the Blue Nile, he reported in favor of the plan for damming the latter body of water. A dam which should raise the level of the lake three feet would store enough water, allowing for evaporation, not only to furnish Egypt and the Soudan with an abundant supply for irrigation, but also to improve the navigation of the Blue Nile during the summer. The objection made by other experts to this plan is based on the fact that the lake is in the territory of King

Menelek, and in case of a war with Abyssinia the Soudan and Egypt might find their water supply suddenly cut off. Among other projects for the reestablishment of communications in the Soudan was the construction of the telegraph line which had been built as far as Khartum in 1900 southward down the White Nile to Fashoda and northeastward up the Blue Nile to Kassala. The necessary wire for this plan, 16,000 kilometres, was waiting at Khartum in 1901 until operations should begin.

It was also proposed to continue the railroad from Khartum to Fashoda, and another road across the desert, from Khartum, by way of Abuharaz, Gedaref, and Kassala to some harbor on the Red Sea, was projected.

The Soudan was declared open to trade in 1899, and several development companies were organized in London to export guns, ostrich feathers, ivory, and valuable woods; but in the first place communication to Egypt was not easy, and, moreover, the country had been devastated by the slovenly policy of the Mahdi and his successor, and, furthermore, trade in articles similar to those produced in the Soudan had been developed in other parts of Africa during the sixteen years in which the region had been lost to civilization. Therefore the success of these companies was not so great as had been hoped.

EICKHOFF, ANTHONY, editor and author, died in New York City, November 6, 1901. He was born at Lippstadt, Westphalia, in 1827, and came to the United States in 1846. In 1848 he founded the *St. Louis Zeitung*, and later edited the *Nordwestlichen Demokrat* at Dubuque. He went to New York City in 1852 to become editor of *Der Abendpost*, and later (1854-56) he edited *Die Staats-Zeitung*. During the Civil War he was commissary-general for the New York troops, and was elected to the State legislature in 1863. In 1876 he was elected to Congress, and from 1891 to 1896 he was fire commissioner of New York City. Mr. Eickhoff wrote *The German in America*, a discussion of German immigration—a subject in which he was deeply interested.

ELECTRICAL ENGINEERING. The year 1901 exhibited general progress and prosperity in all branches of electrical engineering. Some of the most notable advances recorded in special fields of electrical work are noted in detail in the articles referred to at the end of this article. Here attention will be confined to presenting a general bird's-eye view of the whole field of progress in the application of electricity to practical uses. Starting first with electrical communication of signals, telegraphy calls for first mention, because of the notable accomplishment of Marconi (*q.v.*) in flashing wireless signals across the Atlantic Ocean. This most notable result rather dwarfed the other and less striking advances made in the same field, and gave rise to much speculation and prophesy concerning the commercial possibilities of this new means of electrical communication. It is doubtless a field of vast possibilities; but it must not be forgotten, nevertheless, that competent authorities have borne witness that it will be a far cry from the experimental flashing of signals across the Atlantic to the commercial perfection of trans-oceanic wireless telegraphy. (See **WIRELESS TELEGRAPHY**.) In the field of general telegraphy by wire the growth has been moderate. Telephony, on the contrary, exhibited a remarkable growth during 1901. At the end of the year it was estimated that there were fully 1,000,000 Bell telephone stations in the United States, as compared with 800,000 stations in operation twelve months previous, or an increase of quite 25 per cent. These figures do not include the stations of the "independent" companies, which also show a marked growth in number. Technically there have been several notable developments in telephony during the year. Progress was made with the practical development of Professor Pupin's invention of improved circuits, enabling speech transmission for greater distances and with greater clearness than was possible before. During the year the "telegraphone," or recording telephone, was introduced, but was not put in commercial form. The employment of "central energy," lamp-signaling methods, and automatic exchanges also made progress. In electric lighting the progress of the year was along established lines. Perhaps the most notable single item of progress was the enormous advance made in the size of generating stations. The most notable example of these recent giant plants was that of the New York Edison Company, which when completed will deliver 150,000 horse-power of electrical energy for lighting New York City. A notable item of the year's work, from a mechanical point of view, has been the adoption in several notable instances of steam turbines instead of reciprocating steam engines for driving electric-lighting dynamos. At the other end of the line, the year 1901 presents notable advances in the use of the Nernst lamp, where an incandescent substance glows without consumption in open air, and in the development of the Cooper Hewitt tubes, in which a mercury vapor glows with remarkable brilliancy. (See **ELECTRIC LIGHTING**.) In the field of electrical traction, besides the general growth of city electric roads, the year recorded an enormous development of high-speed interurban lines; the electrical equipment of the Boston

elevated and New York elevated railways, and some of the London "tube" railways; and the high-speed tests made on the German military railway between Berlin and Zossen. Among the projects of the year which were significant as indicating the position of electric traction may be mentioned the proposal of the Pennsylvania Railroad to tunnel from Jersey City to Brooklyn, passing under the North and East rivers and Manhattan Island, with a double-track underground line operated by electric power. (See TUNNELS.) In the long-distance transmission of power in the year 1901 a record was established in the Bay Counties (California) transmission line, which, from generators driven by water-wheels in the Sierra Nevada mountains, carry current 222 miles to San Francisco Bay at potentials of 40,000 and 60,000 volts. (See ELECTRIC POWER TRANSMISSION, LONG DISTANCE.) Telpherage is another means of electric transportation which has made notable advances during 1901. (See TELPHERAGE.) In the operation of automobiles by electricity the year exhibited but little advance. In the field of electric heating a technical advance was recorded by the introduction of heaters consisting of thin strips of mica coated with metallic paint. The increasing use of electric motors in factories and shops to run machinery was a notable feature of the year's progress. An attempt to itemize the establishments in which electric-power driven machinery was installed during the year would present the task of naming about every new factory of magnitude and importance built during the year. See STORAGE BATTERY (EDISON), ELECTRIC LIGHT AND POWER, WIRELESS TELEGRAPHY, ELECTRIC POWER TRANSMISSION, TELPHERAGE.

ELECTRIC FOUNTAINS. See ELECTRIC LIGHT AND POWER.

ELECTRIC LIGHT AND POWER. The number of commercial electric lighting stations in the United States on September 1, 1901, was 2,842, and the nominal amount of capital invested in the same was about \$669,000,000. The geographical distribution of stations and capitalization is shown by the accompanying table, taken from the *Electrical Review* for November 9, 1901. The number of stations is not far from correct, being rather too low than too high. The capitalization is the sum of outstanding stocks and bonds, so the actual cash investment may not be more than \$300,000,000 to \$400,000,000. It should be understood, also, that the investment includes long-distance power transmission plants for the utilization of water power. Central stations are constantly increasing in size, due not only to consolidation of companies, but to a centralization of all the electrical generating apparatus in a city or group of cities. In place of the former small generating stations scattered about a city or district, sub-stations receive the current of high potential from the main power station, convert it as may be desired, and send it out to the consumers. Thus the great waterside station of the New York Edison Company sends out current to 16 sub-stations on Manhattan Island and one north of the Harlem River. At the main station there are 16 General Electric 4,500-kilowatt three-phase generators, delivering 25-cycle alternating current at 6,600 volts. Underground cable feeders convey this high-tension current to the rotary convertor sub-stations. In some of these sub-stations generating plants are used, but only three of them will continue to be used, and they will be operated as supplementary to the waterside station at time of maximum load. The rotary converters change the current from alternating to direct, and static transformers are employed to reduce the voltage from 6,300 to as low as 170 if desired.

Table of the electric-lighting industry in the United States, from the *Electrical Review*, November 9, 1901:

State.	Stations.	Capital.	State.	Stations.	Capital.
Alabama	23	\$2,372,500	Maine	47	\$5,113,100
Arizona	9	836,500	Maryland	28	3,700,500
Arkansas	28	2,100,000	Massachusetts	101	45,375,000
California	93	50,192,975	Michigan	147	10,558,745
Colorado	45	19,705,000	Minnesota	104	7,384,150
Connecticut	39	21,384,000	Mississippi	20	1,879,000
Delaware	7	449,000	Missouri	103	25,472,520
District of Columbia...	2	2,000,000	Montana	21	2,259,400
Florida	17	1,073,000	Nebraska	32	2,480,900
Georgia	37	2,132,000	Nevada	4	360,000
Idaho	12	275,000	New Hampshire	40	54,632,015
Illinois	258	30,156,550	New Jersey	62	64,429,000
Indiana	134	11,525,507	New Mexico	5	255,000
Indian Territory	4	73,500	New York	102	102,056,000
Iowa	146	7,496,200	North Carolina	33	2,305,200
Kansas	53	2,947,500	North Dakota	11	542,000
Kentucky	43	6,172,800	Ohio	188	21,879,700
Louisiana	15	2,259,400	Oklahoma	6	395,000

State.	Stations.	Capital.	State.	Stations.	Capital.
Oregon	31	\$5,164,950	Utah	8	\$23,106,000
Pennsylvania	228	110,008,000	Vermont	37	1,500,300
Rhode Island	12	4,708,000	Virginia	40	9,906,500
South Carolina	19	5,106,000	Washington	38	12,962,300
South Dakota	20	804,000	West Virginia	33	1,711,300
Tennessee	40	2,533,300	Wisconsin	93	22,685,600
Texas	97	3,968,400	Wyoming	9	927,000

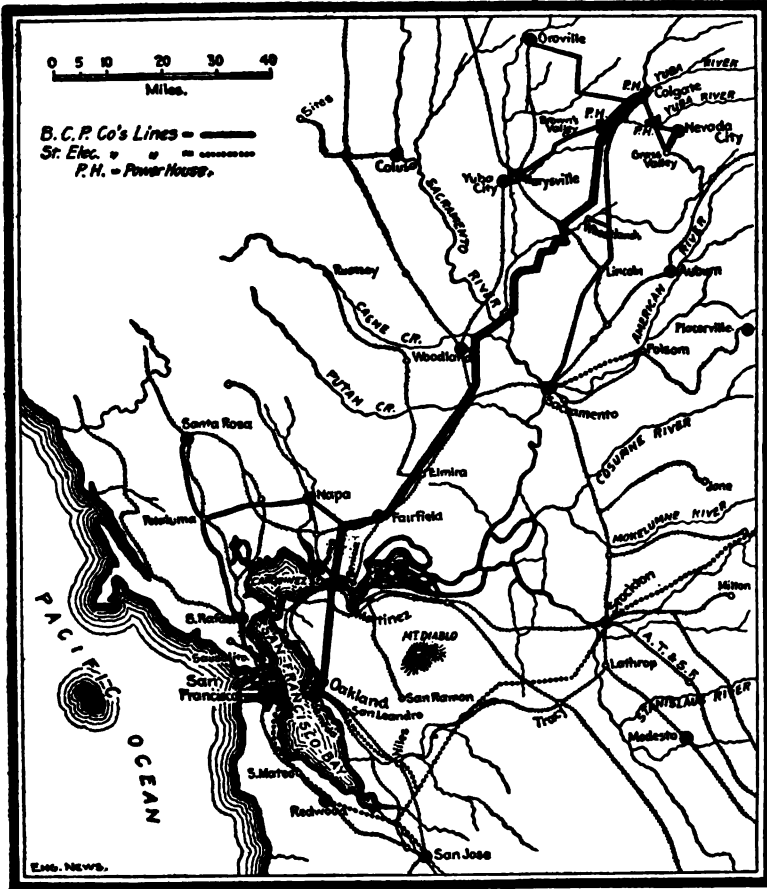
Patents for two new kinds of electric lamps were granted by the U. S. Patent Office in 1901. One group of patents was issued to Peter Cooper Hewitt, for mercury vapor or gas lamps, and another group to Dr. Nernst and several Americans who have been developing the Nernst electric glow lamp in the United States. Neither of these lamps appears to have been put upon the market up to the close of 1901, but both have been used on regular lighting circuits. In the Cooper Hewitt lamp an electric current is passed from one electrode to another through a medium of mercury or other vapor inclosed in a glass tube. In the Nernst lamp the current is passed through a small rod composed of rare earths, such as 70 per cent. of zirconia (oxide of zircon) and 30 per cent. of yttria (oxide of yttrium). In both the Cooper Hewitt and the Nernst lamps, the medium must be heated by some independent means before the desired light is obtained. To provide this preliminary heat and to regulate the lamp has required a large amount of patient investigation. In the *Electrical World and Engineer* for August 31, 1901, there is a long article on *The Development of the Nernst Lamp in America*, by Mr. Alex. Jay Wurts, who, with Messrs. Henry Noel Potter and Marshall I. Hanks, carried on the development of the lamp in America. In the same journal for November 9, 1901, the patents in question are described. The Cooper Hewitt patents are described at length in the issue bearing date September 28, 1901.

Spectacular Illumination.—During 1901 three articles on spectacular illumination were contributed to the *Electrical World and Engineer* by Luther Stieringer, consulting electrical engineer for the Pan-American Exposition. In these articles the history of the development of the electric fountain, the electric tower, and exposition lighting by electricity is described. Luminous fountains were built long before the Christian era. At first the sources of light were candles, fagots, or oil, supplemented by reflectors. Later gas and calcium light were used, and rendered more effective by the use of colors. Electricity was first used for fountain illumination by Sir Francis Bolton, of England, in 1884. A timber operating chamber was placed within the fountain basin in which the piping and the apparatus were concealed. In the roof of the chamber were glass-inclosed light shafts, each having various forms of water jets issuing from their surfaces. The color effect was secured by sliding frames of colored glass. The following year the first luminous fountain in America was built by the St. George's Amusement Company, of Staten Island, N. Y., with Mr. Stieringer as consulting engineer. At the Paris Exposition of 1889 the electrical fountain was a great success, but was surpassed, both in beauty and complexity of design, by the electrical fountain at the World's Columbian Exposition of 1893. Since that time electrical fountains have been prominent objects at all the expositions which have been held, and have also been constructed as permanent decorations of several public parks. Referring to the electric fountain at Prospect Park, Brooklyn, the writer adds: "The success of an electric fountain as a spectacular display depends chiefly on a suitable site and a dark environment, two conditions which are absolutely essential to success." The first object approximating a tower on which electric lights were placed for spectacular effect was a small Christmas tree which Mr. E. H. Johnson, then president of the Edison Light Company, fitted up in 1882 for the amusement of his children. The tree was decorated with miniature lamps, which were colored by being covered with different colored silks. A year later a much more elaborate tree was fitted up by the ladies of Boston at the Foreign Exhibition, and proved to be the feature of the exhibition. The tree was decorated with 160 10 and 16 candle-power lamps, and these various circuits on the tree had different colored lamps, which were turned on and off or "played" in time to music. This was accomplished by means of a switchboard concealed from the audience, which was manipulated by an operator who understood the music. At the Louisville Exposition of 1883 an illuminated circular tower, 30 feet high, was shown which was incrustured with incandescent lamps, arranged in designs and partly covered with colored glass. At the Electrical Exhibition held in Philadelphia in 1884, and again at the Paris Exposition of 1889, there were illuminated towers and after this at a number of indoor exhibitions electrical towers were prominent features. At the Minneapolis Industrial Exhibition of 1890 the "Egyptian Tower of Light" was displayed. This was a column 60 feet high, in the form of a lotus flower. The long stalk was studded with changing lights, manipulated in time with

the music of an orchestra. The surface lighted on this tower was over 4,000 square feet, and on it were 10,000 5-candle-power lamps. At the Columbian Exposition the Edison tower had a prominent place in the electrical building. At the Pan-American Exposition the electrical tower was the principal illuminating feature of the exposition. (See PAN-AMERICAN EXPOSITION.) Passing on from the spectacular illumination of fountains and towers to that of exposition grounds and buildings as a whole, Mr. Stieringer points out that in order to be effective illumination must consist of many small lights, to avoid glare and obtain a diffused light. Indeed, the individual lights must be so small as to give little light separately, and be so grouped, massed, and distributed as to produce the desired effects without raising any point of space to a brilliancy disagreeable for the eye to rest upon. Formerly large units of light have been depended upon to bring into greater prominence the beauties of surrounding effects. To continue in the language of Mr. Stieringer: "The artist upon light looks upon any subject just as a painter does upon a landscape. He has to compose a perfect picture by means of the disposal of illumination, and he must be judged by the resultant whole. For example, to erect huge wooden masts outside the buildings would dwarf the structures. A sea of lights in the paths and lawns would reduce the buildings to islands of darkness. To make each building a blaze of light would blot out the grounds. So that the study of distribution and diffusion becomes for a lighting expert not only a severe problem, but a fascinating and absorbing pursuit." For danger to firemen from electrical wires, see FIRE PROTECTION.

ELECTRIC POWER TRANSMISSION, LONG DISTANCE. The year 1901 saw electric power transmitted on a commercial scale to a greater distance than was ever previously done. This task was performed by the Bay Counties Power Company, of California, whose transmission line runs from the company's powerhouse in the Sierra Nevada mountains to the city of Oakland, on San Francisco Bay, 142 miles. Here connection is made with the lines of the Standard Electric Company, extending to Redwood City, 49 miles farther, and here connection is made with the wires of the Consolidated Light and Power Company, extending to Burlingame, 11 miles farther, making a total distance of transmission of 202 miles. In addition to this series of lines there is a second, made up of the Bay Counties Power Company's 142-mile line to Oakland and the Standard Company's 76-mile line from Oakland to Stockton, a total distance of 218 miles, and a third made up of the 142-mile Bay Counties line and the Standard Company's line to San Francisco, a total distance of 222 miles. The pressures used on these lines is from 40,000 to 60,000 volts. Previous to their completion, the longest electric transmission line in commercial operation was that from the San Bernardino mountains to Los Angeles, California, a distance of 80 miles. This line operated under a pressure of 33,000 volts. Such a long step in advance of previous practice as that recorded by the new Bay Counties line constitutes, it need hardly be said, an engineering precedent of great interest, and it deserves a high position among the electrical events of the year. The following is a brief description of this record-breaking power transmission plant. There are three power stations situated on the various forks of the Yuba River, in the Sierra Nevada Mountains. The plant which supplies power to the Oakland line is located at Colgate, about 36 miles from Marysville, Cal., the river being at this point about 600 feet above sea level. A dam across the Yuba River forms a reservoir from which water is conveyed by a flume $7\frac{1}{2}$ miles long to a penstock about 1,700 feet away from and 715 feet above the power house. From this penstock four lines of 30-inch pipe lead down to a receiver pipe laid parallel to and back of the long, narrow power house. From the receiver pipe the water, under a pressure of 300 pounds per square inch, is led to tangential water-wheels through 14-inch pipes. Each water-wheel drives a generator mounted on the same shaft. There are two 2,000-kilowatt, three 900-kilowatt, and one 720-kilowatt generators. They are three-phase, 60-cycle, 2,400-volt induction machines. To raise the voltage to the intensity required there are 22 transformers. The transmission line from Colgate to Oakland, as before stated, is 142 miles long. In October, 1901, the line voltage was 40,000, but it was intended to increase this to 60,000 volts. Step-down transformers are used at Woodland, Wheatland, Napa, Oakland, and at the substations on both sides of Carquinez Straits, which deliver currents at the various voltages required at the places mentioned. At Oakland the current is transformed to 2,000 volts, which current operates three synchronous motors direct-connected to 550-volt direct-current generators of 450 kilowatts each. This current is used on the lines of the Oakland Transit Company, which owns all the street car lines of Oakland, Alameda, and Berkeley, with a total extent of 126 miles. A branch line carries power to the Oakland central station of the Standard Electric Company, with the radiating lines already noted. The transmission line is in duplicate; that is, there are two transmission lines, one of which is always in readiness to replace the other in case of accident. These two lines run parallel to each other about 25 feet apart. Each line

consists of Oregon red cedar poles spaced generally 132 feet apart and carrying cross arms arranged to place the three wires at the apices of an equilateral triangle. The wire used in one line is No. 00 medium hand-drawn copper; in the other lines the wire is aluminum from Colgate to Suisun, and of copper for the remaining distance.



At certain points on the line the standard rule construction is varied to meet the conditions introduced by the necessity of crossing intervening bodies of water. The most notable of these special crossings is that of the Straits of Carquinez. Here steel framework towers were erected on the banks of the stream, over which cables were stretched so as to swing 200 feet above the water at their lowest points. The distance between the towers was 4,427 feet, and it was necessary for this great span to substitute a stronger cable than one of copper or aluminum. Accordingly a cable seven-eighths inch in diameter, composed of 19 wires of plow steel and having a breaking strength of 96,000 pounds, was substituted for each of the standard cables used on other parts of the lines. It is worth while to note that this is probably the longest span of wire cable ever erected, and that the means devised to render it safe and stable established several precedents in the design of such spans.

ELECTROLYSIS OF GAS AND WATER PIPES. The decomposition of iron and lead pipes by means of stray electric currents is giving rise to an increasing amount of damage to the pipes and of litigation between water and gas interests on the one hand, and the electric railway companies on the other. Damage is reported from London, England, and from Hamburg, Germany, as well as from all parts of the United States. A number of damage and injunction suits against street railway companies were brought in 1901, or continued from earlier years, but no decisions have been rendered by the highest court. In the famous Peoria (Ill.) case a special master in chancery, after an investigation covering three years, recommended that the United States Circuit Court grant an injunction in favor of the

Peoria Water Company against the railway companies of that city. Although the report was filed during the first half of 1901, no decision in the case was handed down during the year. A lower court, at Indianapolis, Ind., rendered a preliminary decision in favor of the Manufacturers' Natural Gas Company against the Indianapolis Street Railway Company. The court, in overruling a demurrer to the suit, strongly upheld the right of the gas company to seek redress for its injuries to its mains when well-known remedies were available. At Pittsburg, Pa., the proprietor of a hotel sued an electric company for damages alleged to have been caused by the failure of the lead water service pipe which supplied the hotel with water. The hotel keeper claimed that the pipe was eaten away by the electric current.

ELEMENTS, NEW. See **CHEMISTRY.**

EMERALDS. See **GEMS.**

ENGINEERING. See **BRIDGES; CANALS; CANALS IN NEW YORK STATE; DAMS; ELECTRICAL ENGINEERING; ELECTRIC LIGHT AND POWER; ELECTRIC POWER TRANSMISSION; GAS, ILLUMINATING AND FUEL; PAVEMENTS, STREETS, AND ROADS; RAILWAYS; SEWAGE PURIFICATION; STORAGE BATTERY, EDISON; TUNNELS; WATER PURIFICATION; WATERWORKS; SHIP-BUILDING; WINDMILLS; and other engineering subjects.**

ENGLAND. See **GREAT BRITAIN.**

ENGLAND, CHURCH OF, the "established" church "in its recognition as the national organization for the maintenance of Christian belief and practice." It is divided into two provinces, Canterbury and York, in each of which there are houses of convocation and houses of laymen, the former controlling doctrinal matters, subject, in some instances, to the sanction of Parliament, and the latter convening to discuss current church questions, but excluding matters of doctrine. There are about 1,400 parishes, in which are 6,030,800 (estimated) church sittings, and a clerical force represented by 2 archbishops, presiding over the provinces of Canterbury and York, 63 bishops, including 22 suffragan and 8 assistant bishops, and 23,000 clergy (beneficed, and curates, and unbeneficed). The colonial and missionary bishoprics number 90, with nearly 4,000 clergy. Rarely in any one year has the church suffered greater loss by deaths in the episcopacy than during 1901. Dr. Mandell Creighton, bishop of London; Dr. William Stubbs, bishop of Oxford, and Dr. Brooke Foss Westcott, bishop of Durham (*q.v.*), were men of great influence, not only in the church, but were distinguished also in various lines of sectarian activity, and especially in the realm of literature. The forty-first annual church congress, at Brighton, was devoted to discussions on subjects of current importance and interest to the church, and included such topics as *Education, The Empire and Church Work, Authority, The Reformation Settlement, The Work of the Church in the Army, Sunday Observance, The Overcrowding Question*, and meetings on church work in charitable and reformatory institutions, and on temperance, religious duties, etc. The meeting of 1902 will convene at Northampton.

ENTERIC FEVER. See **TYPHOID FEVER.**

ENTOMOLOGY. The year 1901 was not especially notable in the study of insects, but some important discoveries were made, and much valuable literature appeared. Perhaps the most interesting work was done along the line of the relationship of insects and disease, especially in the study of the life histories of mosquitoes. In various parts of the world careful investigations have been made upon the habits of mosquitoes, with a view to exterminating them, and cleaning up their breeding places. In Freetown and Lagos, on the West Coast of Africa, Major Ronald Ross, under the auspices of the Liverpool School of Tropical Medicine, has been carrying on some work, and early in September, 1901, he reported that the number of mosquitoes in Freetown had been greatly reduced, some places which formerly swarmed with them being almost entirely free. Empty tin cans, buckets, and broken bottles were gathered, pools and puddles in streets and backyards were drained, and in a few weeks mosquitoes were rarities. In America, New Jersey has been the scene of extensive and important studies, which have resulted in throwing much light on the mosquito problem in that State. The most abundant species was found to be *Culex sollicitans*, which was found breeding not only in brackish and salt water, but in water that was 25 per cent. more salty than ordinary sea-water. It does not breed in fresh water at all. Another fact brought out was that adult mosquitoes may be found at great distances from their breeding places, so that *Culex sollicitans* occurs from twenty to forty miles from salt water, often in great abundance. Mosquitoes also occur from five to fifteen miles off shore, over the open ocean, and there is every reason to believe that the distribution of adults is largely determined by the wind. The second most abundant mosquito, *C. pungens*, was found breeding in almost every sort of place where the water was not salt. It breeds late in the fall, and the adults hibernate. Most important of all the observations, however, are those on *Anopheles*,

the malaria-bearing genus of mosquito. Though these mosquitoes are very abundant and hardy, there is no relation between their numbers and the prevalence of malaria. They occurred in great abundance in some places where malaria is practically unknown. It was shown, beyond question, that cold, and even the formation of ice over them, is not injurious to the larvæ and pupæ of this genus. Observations have recently shown that gold fish may be used as an agent for the destruction of mosquito larvæ, as they eat them eagerly. Some small ponds are kept comparatively free from mosquitoes owing to the presence of these fish. As gold fish are quite hardy, the introduction of them into small mosquito-breeding ponds is well worth while.

In economical entomology, next to the mosquito as a pest, must be ranked the so-called "San José scale," which spread with alarming rapidity during 1901, and is now recognized as a scourge in thirty-five States and Territories of the Union, as well as in Canada. Even as far east as Massachusetts, the control of the pest has become a serious problem. Special efforts have been directed towards determining its natural enemies, and spreading them wherever the scale goes. The original home of the San José scale has long been in doubt, but in November, 1901, it was announced that C. L. Marlatt, of the Department of Agriculture, had discovered the long-sought-for home of the insect in China, in the region south of the Great Wall. He found that it is there preyed upon by a species of lady-bird beetle, and living specimens of the latter were sent to the United States. Investigations in Japan have shown that the scale is widely distributed over the whole empire (except Shikoku), but in most places it is effectively kept in check by a chalcid fly and a lady-bird beetle. It is also important to note that in Japan the scale has been found only on cultivated trees (except close by orchards), which would seem to indicate its being an introduced pest there, probably from China. In the United States more than a dozen legislatures have passed laws intended to reduce the danger from the scale to a minimum, and the Department of Agriculture is engaged in efforts for its suppression by natural enemies, as well as by means of insecticides and fumigation and the use of hydrocyanic acid gas. This gas has also been found to be of great value in ridding buildings of insect pests; for experiments conducted in Washington during 1901 show that flies, spiders, centipedes, cock-roaches, and even mice, are effectively destroyed by one-tenth of a gram of pure cyanide of potassium per cubic foot of space. The gas, which is generated by dropping the cyanide into sulphuric acid, should remain in rooms at least three hours. As hydrocyanic acid in all forms is one of the most violent poisons known, it should only be used with the greatest care, and never by inexperienced persons. Food will probably absorb the gas, and it cannot be used, therefore, where foods are stored, and as it is very inflammable, all fires should be extinguished during its use. Therefore, although it is very effective, its use is attended with much inconvenience and no little danger.

A very interesting discovery made during the summer of 1901 is that the odor of squash bugs (*Anasa*) when very strong is fatal to salamanders, toads, and frogs. Snakes are apparently not affected by it. The odor is given off from a clear, greenish liquid expelled from the anus of the bug. It was shown, in the experiments conducted at the New Hampshire Experiment Station, that the odor from seven bugs was sufficient to stupefy and ultimately kill a half-grown toad. The effect seems to be something like that of chloroform, death resulting only after some hours.

Literature.—The amount of entomological literature published during 1901 was very considerable, and of course only a few of the most important works can be cited here. There were two additions to periodical literature, both bi-monthlies; one, the *Revue Russe d'Entomologie*, devoted especially to the Russian insect fauna; the other, the *Zeitschrift für Systematische Hymenopterologie und Dipterologie*, devoted, as its title indicates, to the study of ants, bees, wasps, flies, etc., especially with reference to their classification and the description of new species. At the opposite extreme from these may be mentioned the numerous popular journals and magazine articles intended to spread a knowledge of insects among the reading public. While many such articles are by competent writers and admirably adapted to their purpose, there were some papers published in leading magazines during 1901 which were crowded with errors and misstatements. Of one such it was well said that "the amount of misinformation it conveys cannot be equalled by any bit of newspaper writing, and for ignorance on the part of the writer, it is certainly entitled to the palm." And the worst of it is, we are told that this paper is "part of a book not meant to be scientific, entomologic, or any other 'ologic, but simply to set down things seen and heard and done." Certainly intelligent readers should be very careful that the books and papers from which they get their information are vouched for by competent scientific authorities.

Of books there are several which demand special mention. One of the most important works on butterflies and moths that has appeared in recent years is Staudinger and Rebel's *Catalog der Lepidopteren des Palaarctischen Faunengebietes*, a volume of nearly 800 pages, including all the known species of Lepidoptera

occurring in Europe, the Nile delta, western and northern Asia, and north Japan, in all nearly 10,000 species. When the work of which this is virtually a third edition first appeared just forty years ago, it included 5,250 species, only a little more than half of the number now given. Another work on Lepidoptera, of possibly even greater importance, is the three volumes upon the *Lepidoptera-Rhopalocera* in Godman and Salvin's *Biologia Centrali-Americana*, the publication of which began in 1879, and is only now completed. There are over 1,300 pages of text and 113 hand-colored plates, the latter illustrating about 1,250 of the more than 1,800 butterflies enumerated. A well-known scientist says of these volumes: "It is no exaggeration to say that it is one of the most perfect examples of careful monographic work which has ever appeared in the English language." A popular work on bees recently published is most noteworthy because its author is the well-known writer, Maurice Maeterlinck. It is translated by Alfred Sutro, and is called *The Life of the Bee*. M. Maeterlinck is a practical bee-keeper and his book is accurate and reliable as to its facts; but the style is meditative, speculative, and rather gloomily philosophical. Of American books there are two which demand special mention, both by Dr. L. O. Howard, the government entomologist. One is called *Mosquitoes: How they live; how they carry disease; how they are classified; how they may be destroyed*. It is exhaustive, interesting, and accurate, and will long be the standard work on this subject. Dr. Howard's other book is called *The Insect Book*, and its contents are clearly shown by the sub-title: "A Popular Account of the Bees, Wasps, Ants, Grasshoppers, Flies, and other North American Insects, exclusive of the Butterflies, Moths, and Beetles, with full Life-Histories, Tables, and Bibliographies." It is a volume of over 450 pages, profusely illustrated with 47 plates and 264 wood-cuts, and is invaluable to any one interested in insects.

EPILEPSY is a condition not well understood, in which there is a sudden liberation of nerve energy from the brain, due to loss of the usual control or the usual harmonious action of the nerve centres in the cerebral cortex. Four varieties of epileptic attacks are described by neurologists. Attacks which resemble these in some respects, but which are due to toxins, fatigue, etc., are called epileptiform attacks. The most frequent variety of epileptic attack consists of a convulsion, or fit, during which consciousness is lost, the patient falls, a part or the whole of the body twitches and is contorted, the patient froths at the mouth, bites his tongue or cheek, and his face becomes bluish or purplish. Before the attack he is usually irritable, morose, and depressed, and has a voracious appetite. After the convulsion ceases, he usually sleeps for a quarter or half hour, awaking languid and tired, with tenderness in the muscles, as if they had been bruised. This variety of attack is called *grand mal*. The second variety consists of a loss of consciousness lasting 4 or 5 seconds, in which the patient does not fall or become convulsed, but remains rigid, suspending whatever occupation he may be engaged in, looks fixedly before him without winking, then draws a deep inspiration, relaxes, and returns to consciousness. This form is called *petit mal*. The third variety of epilepsy is called psychic epilepsy. In this form, after the usual despondency, irritability, restlessness, dread, giddiness, or, in some patients, elation, in others a voracious appetite, instead of a fit the patient experiences a sudden attack of laughing, weeping, or shouting, with extravagant gestures, and even, in some examples, with uncontrollable homicidal impulse devoid of motive. On returning to consciousness the patient is entirely ignorant of what he has done during this period, which may resemble mania. The fourth variety of epileptic attack is called Jacksonian epilepsy. In this variety there is a convulsion limited to a part of the body, as to an arm or a leg, without loss of consciousness. Jacksonian epilepsy is usually a symptom of brain tumor. Before, as well as after, an ordinary convulsion of the first or second variety, there is, in some cases, a psychical manifestation, consisting of an attack upon some one, a theft, or a destructive act. Such a manifestation is purely automatic and irresponsible, for the patient is already unconscious. A leading idea, delusional or otherwise, prevailing in the patient's mind, such as a grudge or resentment, may become operative in the post-paroxysmal stage; and the patient may perform complex acts, automatically, that have every appearance of being volitional. The assault on the German emperor in March, 1901, was probably made by an epileptic. The man had several fits after throwing a piece of iron at his majesty and wounding his cheek; and it is possible that he was unconscious and acting automatically, in a pre-paroxysmal psychical stage, without volition or responsibility.

EPILEPTIC COLONIES. The State Board of Charities of Illinois conditionally accepted, in 1901, a parcel of ground at Northcliff, Jersey County, Ill., as the future location of an epileptic colony. It was reported by the governor during the previous year that there were more than 5,000 epileptic inmates of various charitable institutions in the State, awaiting transfer to the projected colony. In March, 1901, the house of representatives of Indiana passed a bill providing for a colony for the epileptics of that State. Not less than 1,000 acres of land are to be acquired for

this purpose, and \$40,000 is to be appropriated for the purchase of the land, as well as \$160,000 for the projected buildings. The site has not yet been selected.

The first epileptic colony in the United States, and an ideal and model in all respects, Craig Colony, at Sonyea, N. Y., is preeminent. It occupies a tract of over 1,000 acres in the fertile Genesee Valley, near Mt. Morris, well watered and largely under cultivation. The tract was purchased from a decreasing Shaker community in 1894, with many buildings in good condition and several well-built roads and railway connections. The grounds are divided by the Kishaqua creek, which allows complete separation of the sexes. On the creek is a grist mill and a sawmill. Brick clay beds and limestone deposits exist on the property. The colony was opened for the reception of patients in January, 1896, and the sixth fiscal year ended September 30, 1901. During these years schools have been maintained for English branches and for manual training, workshops for the manufacture of brushes, mats, shoes, clothes, and bricks have been in operation, and printing, blacksmithing, painting, dressmaking, and tailoring have been carried on by patients, besides raising of live stock and farming. On September 30, 1900, there were in the colony 612 patients, 329 males and 283 females. During the year 1900-01, 259 were received, 198 males and 61 females; 80 were discharged, 36 died, and 12 were transferred-as insane to State hospitals, leaving the numbers on September 30, 1901, as follows: 440 males and 303 females, making a total of 743. The average daily attendance was 676.41. The annual per capita cost decreased from \$300.02 in 1897-98 to \$164.42 in 1900-01. Of the 1,104 patients received into the colony since its inception, 16 per cent. had epileptic ancestors, 15 per cent. had alcoholic ancestors, 14 per cent. tubercular ancestors, and 8 per cent. insane ancestors. The number of recovered or improved patients among those discharged in 1900-01 is not stated in the annual report.

EPIPLOPEXY. See LIVER.

EPISCOPAL CHURCH. See PROTESTANT EPISCOPAL CHURCH.

EPISCOPAL CHURCH, REFORMED. See REFORMED EPISCOPAL CHURCH.

EPWORTH LEAGUE, the result of a union of several societies, was formed in the Methodist Episcopal Church in 1889. Its objects are the promotion of spiritual development among young people, and embrace features for social and intellectual as well as for religious advancement. The league now has a total membership of 1,900,000 enrolled in 21,000 regular and 7,600 junior chapters. The *The Epworth Herald* is the official organ of the society. A successful international convention was held July 18-21, 1901, in San Francisco. President, Bishop T. W. Joyce, D.D.; secretary, Rev. J. F. Berry, D.D.; treasurer, R. S. Copeland, M.D.; central office, 57 Washington Street, Chicago, Ill.

EPWORTH LEAGUE OF THE M. E. CHURCH, SOUTH, since its organization in 1891, has gained 306,580 adherents, included in 5,838 chapters. The activities of the league are developed along lines similar to those of the northern-body. The *Epworth Era* is a representative periodical. President, Bishop W. A. Candler; secretary, Rev. H. M. Du Bose, D.D., Nashville, Tenn.; treasurer, O. W. Patton.

ERITREA or ERYTHREA, an Italian colony on the western coast of the Red Sea, extends from Cape Kasar, the eastern limit of the Egyptian Soudan, for some 670 miles, to French Somaliland, at the Strait of Bab-el-Mandeb. The estimated area is 88,500 square miles, and the population, which is largely nomadic, is placed at 450,000. The residence of the Italian civil governor is at Massawah, the chief town and port (population about 7,800). Thus far the colony has been no small burden to Italy. For the fiscal year 1899 the revenue and expenditure were estimated at 2,491,600 lire and 10,622,400 lire respectively, and for 1900 at 2,456,700 lire and 10,587,500 lire respectively, the deficits being made up by the Italian government. The lire is worth 19.3 cents. The rearing of cattle and other live-stock is the most important industry. The imports at Massawah in 1899 were valued at 9,071,391 lire and the exports 1,628,154 lire. A military railway from Massawah to Saati, 17 miles distant, is being extended to Asmara. Massawah is connected by telegraph with Assab, 319 miles, and Assab with Perim, 62 miles. A telegraph line has been projected to connect Massawah with Adis Ababa, in Abyssinia. Pursuant to the Franco-Italian protocol signed in January, 1900, the boundary between Eritrea and French Somaliland was delimited in March, 1901. Assab, which is of some importance as a caravan terminal, was assigned to Eritrea. An agreement defining the boundary with the Egyptian Soudan was signed in April, 1901.

EROS. See ASTRONOMICAL PROGRESS.

ERRAZURIZ, FEDERICO, president of Chile, died July 12, 1901. He was born at Santiago, Chile, September 16, 1850, the son of a former president of Chile, and was admitted to the bar as a lawyer in 1876. Elected first to the Chilean congress in the same year, Señor Errázuriz held his seat until 1889, when he was elected to

the senate. During the administration of President Balmaceda he held the portfolio of war, and under President Montt that of justice and public instruction. As the candidate of the Liberal-Conservatives he was elected president in 1896, which position, on account of ill health, he resigned shortly before his death. Well fitted by nature and education for executive leadership, President Errázuriz met with great credit to Chile and himself the numerous international and economic problems that confronted his administration.

ESCHENHAGEN, Max, physicist and from 1899 director of the Royal Prussian Magnetic Observatory, died November 12, 1901. Besides designing improved magnetic instruments, several of which are used in the international magnetic surveys now in progress, he prepared the plans for the magnetic observations to be made on German Antarctic expeditions, and arranged for simultaneous observations to be carried on at different stations throughout the world during the explorations. He was the author of many papers on terrestrial magnetism and allied subjects.

EUPHRATES VALLEY RAILWAY. See **TURKEY** (paragraphs on History).

EVANGELICAL ASSOCIATION, founded in 1800, also known popularly as the German Methodist Church from points of similarity in polity and mode of worship, now has 27 conferences, in the United States, Canada, Germany, Switzerland, and Japan, which include 119,936 members. There are 1,836 churches, with property valued at \$6,126,430, and 1,083 itinerant and 476 local preachers, while the Sunday schools number 2,186 with nearly 25,000 officers and teachers, and are attended by some 150,000 scholars. Collections for the year aggregated \$1,094,562, of which \$147,081 was received for missionary enterprises. These statistics indicate a uniform progress in the year 1901. The church has a flourishing Young People's Alliance, which includes 33,626 adherents in its 1,119 branches. It maintains a publishing house in Cleveland, O., the periodical literature of which both in the English and German languages, is extensive. The *Evangelical Messenger* is a representative denominational paper. The general conference of the church, which has convened regularly in quadrennial sessions since 1843, next meets in 1903; the individual conferences hold annual meetings. See **UNITED EVANGELICAL CHURCH**.

EVARTS, WILLIAM MAXWELL, American lawyer and statesman, died in New York City, February 28, 1901. He was born in Boston, Mass., February 6, 1818, and graduated at Yale in the class of 1837. While in college he founded and edited the *Yale Literary Magazine*, and was one of the three "high oration" men of his class. In 1838-39 he studied in the Harvard Law School, and then went to New York City, where he entered the office of Daniel Lord, and was admitted to the bar in 1841. From the beginning of his legal career, Mr. Evarts attracted attention by the soundness of his learning and his comprehensive grasp of the larger aspects of the law. Though never a politician, he was early in his experience (1849) made assistant United States district attorney at New York, and two years later, at the age of 33, promoted to district attorney, serving until 1853. Among the important cases which he had to deal with while in this position was the prosecution of the leaders in the *Cleopatra* filibustering expedition to Cuba, a matter involving many principles of international law and relationship. Another concerned the right of southern slave-owners to take slaves in transit through New York, the decision of which denied that right. He headed the New York delegation to the Republican convention at Chicago in 1860, and in a notable speech nominated his intimate associate, William H. Seward, for President, but finally had the honor of moving the unanimous nomination of Abraham Lincoln. His greatest legal triumph was the defense of President Andrew Johnson in the great impeachment trial in 1868, when, as senior counsel, he was successful in turning the almost unanimous sentiment of the Senate for conviction to a doubt strong enough to dismiss the charge by a majority of one vote. In this case Mr. Evarts' argument was on the broad ground that to punish merely unbecoming and vexatious behavior (of which President Johnson stood convicted) with dismissal from office, would destroy that calm, judicial spirit and that forbearance in critical emergencies that are essential to the carrying out of a system of popular government. This was typical of his view of the law. In July, 1868, he was made attorney-general in Johnson's cabinet, and held that portfolio until March of the following year. In 1871 he appeared before the Geneva tribunal as counsel for the United States in the famous Alabama claims case, when England was directed to pay the United States \$15,500,000 for depredations committed during the Civil War by Confederate cruisers built in England. His place as the foremost international lawyer of America was fixed by this success as firmly as his primacy as a constitutional lawyer had been established by his conduct of the Johnson impeachment. Another notable legal battle in which he was engaged was the case of Theodore Tilton against Henry Ward Beecher, in which he defended Beecher (1874). The Hayes-Tilden contest of 1876, when the returns of Hayes presidential

electors from Louisiana were bitterly contested by the Democrats in Congress, on the ground that intimidation and force had contributed to the result, afforded Mr. Evarts another opportunity to show his firm grasp of constitutional law. As the basis of his argument in support of Hayes, Mr. Evarts showed that the Federal government could go behind the State returns only at the gravest risk of impairing that State's sovereignty. This argument was recognized as sound, the Louisiana returns were admitted, Hayes was elected President, and Mr. Evarts was made secretary of state in 1877. He filled this office with dignity and brilliancy, and with the sound judgment which always characterized his official acts. One of his notable works was the report he made in 1880 on the subject of the American control of any trans-Isthmian canal that might be built, whether at Panama or at Nicaragua, and it was upon his advice that President Hayes took the view of the necessity for exclusive American control of such a canal. Mr. Evarts retired from the state department in 1881, and four years later he was elected to the Senate, retiring at the end of his term in 1891. With his retirement from public life, Mr. Evarts practically gave up active work, and his appearances in the courts were very infrequent. He was a graceful and powerful orator, especially famous as an after-dinner speaker, and his addresses were numerous, including the famous eulogy of Chief Justice Chase in 1873, the centennial oration at Philadelphia in 1876, and the speech at the Bartholdi monument unveiling in New York City, 1883.

EVOLUTION. See BIOLOGY.

EXPECTORATION. See HYGIENE.

EXPERIMENTAL PSYCHOLOGY. See PSYCHOLOGY, EXPERIMENTAL.

EXPERIMENT STATIONS. See AGRICULTURE and ZOOLOGICAL EXPEDITIONS AND STATIONS.

EXPLORATION. See AFRICA; ANTARCTIC EXPLORATION; ARCTIC EXPLORATION; and HEDIN, SVEN.

EXPOSITIONS. See GLASGOW EXPOSITION, LOUISIANA PURCHASE EXPOSITION, PAN-AMERICAN EXPOSITION, and SOUTH CAROLINA EXPOSITION; and for the electrical illumination of expositions, see ELECTRIC LIGHT AND POWER.

EYRE, EDWARD JOHN, ex-governor of Jamaica, died at Tavistock, England, November 30, 1901. He was born in Yorkshire, August 5, 1815, and was educated at the Sedburgh Grammar School. In 1833 he went to Australia and engaged in sheep and cattle raising. Later he devoted a large part of his time to exploration, the result of which he published in 1845 in *Discoveries in Central Australia*. In 1846, soon after his return to England, he was appointed lieutenant-governor of New Zealand, and in 1854 was sent in the same capacity to the West Indian island of St. Vincent, being transferred in 1859 to Antigua as acting governor of the Leeward Islands. In 1864 he was made governor-in-chief of Jamaica, and his drastic measures in stamping out a rebellion of the natives resulted in an active prosecution by a "Jamaica Committee," headed by John Stuart Mill. Notable as a defender of Governor Eyre's acts was Carlyle, and after a long succession of trials the controversy was dropped and Governor Eyre retired to private life.

FABER, BARON JOHANN LOTHAR VON, German manufacturer, died at Nuremberg, January 15, 1901. He was born at Stein, June 12, 1817, and in 1839 assumed direction of the lead-pencil factory founded at Stein by his great-grandfather in 1760. At that time only 20 workmen were employed, but the new director abolished the antiquated methods then employed and effected such improvements that, instead of suffering from competition by foreigners, the factory increased its producing capacity until Germany depended upon its output. Branches were established in New York, Paris, Berlin, and London, and agencies in many other cities. Later, copying pencils were produced, and all sorts of artists' materials, and, beginning with 1856, specially prepared slates and slate-pencils, by means of a contract with the owners of newly discovered graphite in Siberia. At Noisy-le-Sec, near Paris, there is a community of 1,100 employees of the factory for artists' materials, for whom Baron Faber established savings banks, dwellings, schools and churches, and institutions for instruction in drawing. He was made a baron in 1881.

FALKLAND ISLANDS, the largest group in the south Atlantic, lying 300 miles east of the Straits of Magellan, constitute a British crown colony. South Georgia, an uninhabited island about 1,000 miles to the southeast, is included in its jurisdiction. The Falkland group consist of East Falkland, area 3,000 square miles; West Falkland, area 2,300 square miles, and upward of 100 smaller islands, the area of the whole being about 6,500 square miles, and the population, in 1901, 2,043. South Georgia has an area estimated at 1,000 square miles. The capital and chief town is Port Stanley, which is located on East Falkland, and has a population of 789. The revenue in 1900 was £15,576 and the expenditure £15,502. The imports in the same year were £66,948 and the exports £111,539, wool being the largest item

and amounting to £95,833. The trade is almost entirely with Great Britain. Sheep-farming is the chief industry, there being 2,325,154 acres of pasturage and 779,900 sheep (1900).

FARM ANIMALS. See AGRICULTURE and DAIRYING.

FARMERS' INSTITUTES. See AGRICULTURE (paragraph Agricultural Education).

FATIGUE. See PSYCHOLOGY, EXPERIMENTAL.

FEDERATED MALAY STATES, occupying a part of the southern Malay Peninsula, are under British protection and administered under the advice of a British resident-general. The federation comprises Perak, Selangor, Pehang, and Negri Sembilan, the latter itself a confederation of nine small island states. The combined area is about 25,100 square miles. The population has increased from 418,509 in 1891 to 676,138 in 1901. The government in each state is in charge of a sultan, advised by a British resident. There is a British resident-general for the whole federation, subject to instructions from the high commissioner, who is the governor-general of the Straits Settlements (*q.v.*).

Since the Federated States were brought under British protection in 1874, the revenue has increased from about 1,000,000 dollars (the dollar is worth about 50 cents) in that year to over 15,500,000 dollars in 1900; the latter figure exceeded the revenue for 1899 by over 2,000,000 dollars, and was nearly 3,000,000 dollars greater than the year's expenditure. The largest source of revenue is the export duty on tin, which in 1900 amounted to 7,000,000 dollars.

The foreign trade in 1900 amounted to about 10,000,000 dollars more than the trade of 1899, being nearly 100,000,000 dollars, of which about 60 per cent. represented exports. Unlike the Straits Settlements proper, the Federated States have no transit trade, and the figures here stated represent the real produce of the country and the amount of goods bought for local consumption. The chief product is tin, Perak and Selangor exporting a greater part of the Straits Settlements' production. There are extensive coffee plantations, which have recently become very profitable, and rice, sugar, pepper, and spices are also raised for export.

Since the Federated States have been under British protection over 250 miles of railway, 1,300 miles of cart road, 1,400 miles of telegraph line, and numerous public buildings and works have been constructed. In 1901 there were over 100 miles of railway under construction. In 1900 the government of Perak was engaged in effecting the irrigation of some 60,000 acres of land at a cost of about 1,000,000 dollars.

FEDERATION OF LABOR, AMERICAN. President, Samuel Gompers; secretary, Frank Morrison, Washington, D. C. The federation was organized in 1881 and had a membership in 1901 estimated at 1,254,000. During 1901 the membership increased by 364,410. The federation now embraces 87 national and international unions, 327 city central labor unions, 20 State federations of labor, 399 federated labor unions, and 750 local unions. The report of the secretary showed a total of 1,056 strikes of all kinds reported. By these strikes, 153,505 workmen benefited, and 12,707 were not benefited. The total cost of the strikes reported was \$548,003. The report of the treasurer showed total receipts of \$126,522; expenditures, \$118,708; on hand, \$8,814. The report of President Gompers noted the growing tendency to agreement in industry, denounced the employment of children, argued for a larger measure of organization among women wage-earners, and recommended a change in the constitution to permit a larger assessment, with a levy by the executive council early in the year of a portion of the assessment provided, "so that a fund may be at its disposition at any time in the interests of any of the affiliated organizations engaged in a protracted struggle which they could not singly support." The leading practical question before the federation was, as always, that of trade autonomy. It was urged by the brewers and the United Mine Workers that all trades in one industrial establishment should form one organization for the better advancement of the condition of all. The United Mine Workers contended, for example, that if a comparatively small number of engineers or firemen employed in the mines should strike, as actually happened in the anthracite region in 1900, it would cause all mines affected to be closed and would throw out of work large numbers of men who had no grievance. They argued, therefore, that all trades in the mine should be united under one head in order to avoid the possibility of such friction of interests. The special committee on trade autonomy recommended that when there are only a few craftsmen in a large concern, the best interests of all would be served by the few joining the paramount organization in such establishments, and the amalgamation of subdivided crafts into district and national trade councils, where all disputes should be settled. On the other hand, the executive council decided against the brewery workers in their attempt to force the engineers, firemen, and coopers into their union, and this was regarded as a victory for trade

autonomy. The federation decided to increase the per capita tax of the national and international unions from 1-3 to $\frac{1}{2}$ of 1 per cent. on monthly wages, and to raise the per capita tax of federal and local unions from 5 to 10 cents a month for each member, the increase of 5 cents to go toward the raising of a defense fund.

Considerable acrimony was developed in the debate on a proposition to increase the number of vice-presidents from 6 to 8. It was charged that the executive council already exercised an undue measure of control over the federation, and that this proposal was for the purpose of increasing a power which was already too great. The resolution was voted down, along with a proposition to increase the salaries of the president and secretary. The federation again put itself on record as opposed to any official endorsement of Socialism in the following, which is part of a resolution on the subject: "We declare that since the inception of our movement, inquiry into the best form of government has been its guiding star, and will so continue while there is a high moral desire to gratify or an injustice to correct. Our meetings, local and national, are now, and always have been, free to the discussion of any legitimate economic or political question; but, on the other hand, are as equally pronounced against parties and politics, religious discussions, or race prejudices, and as success has followed these meritorious conclusions, we would be unfaithful to the duty we owe mankind to do other than strongly recommend a continuance of the methods, the inculcation of which means the greatest amount of safety to our movement with the least degree of danger." Important resolutions rejected were: (1) Opposing ticket scalping; (2) providing for a universal label; (3) organizing female core-makers employed in foundries; (4) instructing union members to hold aloof from State militia (tabled); (5) protesting against the making of cigars by machinery. Important resolutions adopted were: (1) In favor of a Chinese exclusion law; (2) recommending that organizers make an effort to organize school teachers; (3) that legislatures be petitioned to enact a law to compel the construction of machinery to cover all dangerous parts in such a way as to protect employees working around machinery; (4) that no boycotts be declared until the central labor unions have endeavored to effect an amicable settlement; (5) that government officials should enforce the child labor eight-hour law on all government work in private shipyards; (6) petitioning Congress to amend the marine laws so that every seaman shall have the right to quit any merchant vessel which has become obnoxious to him, and also to prohibit the towing on the ocean of gigantic rafts; (7) authorizing the federation to send representatives to conventions of national and international organizations, particularly those of railway employees; (8) instructing the executive council to make effort to secure the passage of a law protecting and legalizing union labels.

FEE, JOHN G., abolitionist and founder of Berea (Ky.) College, died at Berea, January 11, 1901. He was born in Bracken County, Ky., September 9, 1816, and studied at Augusta College, Miami University, and Lane Theological Seminary. Although born in a slave State and the son of a slave-holder, he early inveighed against slavery, and in consequence was disowned by his family and expelled from his church. His crusade was attended by great physical danger from mobs. He removed to Berea in 1853 and established a church on ground purchased by his friend, General Cassius M. Clay, and therein continued, in spite of violent opposition, to preach abolition. In 1855 he founded Berea College for the education of both whites and negroes. It has been successful and now has 700 students.

FELDSPAR. The production of crude feldspar in 1900 was 1,787 short tons, valued at \$7,259, while ground material amounted to 19,566 short tons, valued at \$166,490. Much of the product is ground at the mines. In recent years considerable feldspar of high quality has been imported into the United States from Canada and is used by the Trenton potteries, and also in the manufacture of wood filler, scouring soap, and glass.

FENCING. The sport of fencing showed little change in popular interest during 1901. The eighth annual intercollegiate championships were held at New York on April 6, and were won by the United States Naval Academy in a contest with Cornell. Columbia was third, with 5 bouts less than Cornell. The surprise of the tournament was the defeat of Harvard, the winner of the previous year. Yale was entered, but withdrew at the last moment. In the struggle between Annapolis and Cornell the decision was rendered only after several extra bouts. Scores: Annapolis, 18; Cornell, 17; Columbia, 12; Harvard, 5. Individual: Henry, Annapolis, 8 won, 1 lost; second, Clark, of Columbia, and McBride, of Annapolis, 7 won by each.

The national championships of the Amateur Fencers' League of America were held at New York, April 26-27. The team championship was won by the Fencers' Club of New York, 6 bouts; New York Athletic Club, 3 bouts. The individual championships: Foils: Charles Tatham, Fencers' Club, 16; Charles Bothner, New York Turn Verein, 11; Fitzhugh Townsend, Fencers' Club, 10. Sabres: A. V. Z. Post, Fencers' Club, 20 points; F. L. Slazenger, New York Athletic Club, 18½;

J. L. Irving, 17. Duelling swords: Charles Tatham, 14 bouts; Charles Bothner, 12; A. De Diaz, 10. Single sticks: F. L. Slazenger, 21; John Allan, 19; J. L. Irving, 14. The junior team championships, New York, March 9, were won by Annapolis; second, Columbia; third, New York Turn Verein. At the sixth annual contest of juniors for the Morris medal there were representatives from the New York Fencers' Club, Columbia, Yale, Cornell, New York Athletic Club, and New York Turn Verein. The Fencers' Club won, 57; New York Athletic Club, 4.

FERNANDO PO, an island lying off the coast of Cameroon, belonging to Spain, has an area of about 780 square miles and a population of some 25,000. The German press, in July, 1901, reported that Germany had acquired the right of preemption of the island. Germany already had the right to establish a coaling station on Fernando Po, and a small concession in James Bay. The value of the island consists in its cacao and coffee plantations, which in 1901 numbered about 140 and were controlled by half-breeds, Spaniards, Englishmen, and a few Germans. Trade has been carried on almost exclusively by Spaniards and Englishmen.

FERTILIZATION, ARTIFICIAL. See BIOLOGY and PHYSIOLOGY, CHEMICAL.

FIJI is a crown colony of Great Britain situated in the southern Pacific Ocean, 1,100 miles north of New Zealand. The islands are about 225 in number, of which about 80 are inhabited. They extend 300 miles east and west, and an equal distance north and south. The area of the colony, including Rotumah, is 8,045 square miles. The two largest islands are Viti Levu (Great Fiji) and Vanua Levu (Great Land), having areas of 4,112 and 2,432 square miles respectively. The capital is Suva, a port of Viti Levu. The population, March 31, 1900, was 117,870, of whom 2,447 were Europeans, the remainder being for the most part native Fijis and Indian immigrants. The colony is administered by a governor appointed by the crown and assisted by a council of three members. There is a legislative council composed of six official and six unofficial members, nominated by the crown, of which the governor is president. Native chiefs administer tribal or communal government, under the governor's supervision. There is no military establishment except a battalion of European volunteers, raised in 1899, and an armed native constabulary. The public income for 1900 was £111,569, the expenditures £102,022, and the public debt is £200,536, about half of it bearing interest. The chief products, from about 50,000 acres of land under cultivation, are bread fruit, bananas, plantains, peanuts, yams, coconuts, sugar cane, tea, cotton, maize, tobacco, and arrowroot. Sugar, distilled spirits, and green fruits are exported in considerable quantities. The total exports for 1900 reached a value of £613,808 (an increase of £137,980 over 1899), including sugar, 32,961 tons; copra, 15,605 tons; distilled spirits, 158,224 gallons. The total imports for the same year amounted to £343,864, including £23,358 of live-stock. The increased production of copra in part accounts for the increase of exports. Of the total trade, the port of Suva is credited with £770,266 and Levuka with £109,400. The wharves at Suva, in 1901, were being extended to accommodate the increased traffic of the port.

Education in Fiji is conducted mostly by the religious institutions, the Wesleyans and Roman Catholics predominating. The natives are tractable to European influence and peaceable among themselves. Christianity is making progress in the islands.

FILARIA. The filariæ are a parasitic family of the Nematoda. *Filaria medinensis* ("Guinea worm") is found in different tissues of the bodies of negroes in Guinea, Senegal, Egypt, Arabia, Persia, and India. It is from 1 to 10 feet long and about one-tenth of an inch wide, and causes painful tumors, blisters, or boils, and sometimes gangrene. *Filaria sanguinis hominis*, which is about one seventy-fifth of an inch long, is found in the blood; it is indigenous to Africa, India, China, Australia, and Brazil, and has been found in negroes in our southern States. The parasite is transmitted by mosquitoes. Strong, of the chief surgeon's office, Division of the Philippines, in 1901 found a case of filariasis in Iloilo. The embryos of *filaria nocturna* began to appear in the blood of this patient at 6 P. M., and were numerous at midnight. He believes that it is probable that filariasis will become domesticated in the southern States, through the return of American soldiers. In 1901, Low, of Rome, published studies of the development of *filaria nocturna* in mosquitoes found in St. Lucia, *Culex fatigans* and *Culex terriatus*. From twelve to twenty-four hours after the *Culex terriatus* had fed on a patient suffering from filariasis, Low found active filaria embryos in the thoracic muscles of the mosquito. After developing slowly for from seven to nine days, these embryos degenerated and never reached maturity. In *Culex fatigans* filaria embryos mature rapidly, and the perfect filariæ are found in the head, neck, and proboscis of the mosquito.

FINANCE. See the articles on the United States, the States of the United States, and foreign countries; also BANKS—BANKING and the following article.

FINANCIAL REVIEW OF THE YEAR. *The Stock Market and Current Events.*—The course of prices of 22 leading stocks on the New York Stock Exchanges during 1901 was as follows:

RAILROADS.

INDUSTRIALS.

The movement of averages, as given by the *Wall Street Journal*, is as follows:

12 Industrials.		20 Railways.	
Dec. 27, 1900	71.04	Jan. 12	97.85
Jan. 19, 1901	64.77		93.56
May 1, 1901	75.93		117.86
May 9, 1901	67.38		103.87
May 13, 1901	71.92	May 10	110.06
May 14, 1901	69.50		104.54
June 3, 1901	77.73		115.69
June 8, 1901	76.07	June 11	114.39
June 17, 1901	78.26		117.65
July 15, 1901	69.46		106.35
July 29, 1901	72.94	July 18	111.50
Aug. 6, 1901	69.05	Aug. 5	104.86

12 Industrials.		20 Railways.	
Aug. 26, 1901	73.83	Aug. 5	111.69
Sept. 13, 1901	67.25		105.30
Sept. 20, 1901	70.47	Sept. 21	110.82
Oct. 5, 1901	63.48	Oct. 7	106.20
Oct. 11, 1901	65.91	Oct. 26	110.88
Oct. 28, 1901	64.01		109.60
Nov. 11, 1901	66.52		114.56
Nov. 14, 1901	65.36		112.35
Nov. 22, 1901	65.88		115.21
Dec. 12, 1901	61.61		110.08
Jan. 6, 1902	64.90	Jan. 2	115.85

The movement of stock averages may be generally divided into two periods for the industrials and two for the railroad shares. From January 19, 1901, until the first week in May there was an average advance in railroad shares of 20.01 points. This was followed by a sharp reaction on May 19, and that in turn by a quick recovery to 117.65 on June 17. From June 17 to the end of the year the average remained fairly constant, ranging from a low point of 105.30 on September 13 to a high point of 115.21 on November 22. The movement of industrial shares was generally upwards until June 17, showing an extreme rise from January 19 of 13.49 points. From June 17 the general tendency was downward, the extreme decline on December 12, when the average stood at 61.61, being 17.65. The conclusion from these tables of averages is that during the first five months of the year both railway and industrial shares were in great demand at high and rising values, and that during the last seven months, while railways maintained their position, the prices of industrials fell heavily, and on the whole steadily.

The leading events of financial importance were: (1) The purchase of the Central Railroad of New Jersey for the Reading in January; (2) the formation of the United States Steel Corporation (*q.v.*); (3) the purchase by the Union Pacific of a controlling interest in the Southern Pacific, the two latter transpiring in February; (4) the announcement of the approaching consolidation of the Boston and Butte Copper and Silver Mining Company and the Boston and Montana Consolidated Mining Company with the Amalgamated Copper Company, and the settlement of the difficulties between the last-named company and the American Smelting and Refining Company; (5) the purchase by the Great Northern and Northern Pacific Railway Companies of the stock of the Burlington; (6) the panic of May 9; (7) the strike of the steel workers in July and August; (8) the drought in the Western States in July and August; (9) the reduction of the dividend on Amalgamated Copper on September 20; and (10) the organization of the Northern Securities Company in November.

The tremendous and far-reaching combination of industrial and railway properties during the early months of 1901 converted an upward movement in the stock market, begun immediately after the second election of President McKinley, into the most remarkable speculative boom on record. During April, while the boom was at its height, the total share sales amounted to 41,719,086 shares, the largest previous total being 30,285,055 shares, in January, 1901. On the 30th of April the sales of shares footed up 3,281,286, the largest ever recorded. In addition to the important combinations announced, a number of others were rumored. The phrase "community of interest" was used to explain a totally new situation in the financial world, which would make competition impossible and place corporate earnings on a permanently higher basis. An immense number of people in all parts of the country and in every condition of life invested their accumulations in the purchase of stocks. Under the stimulus of this heavy buying, as may be seen by reference to the preceding table of stock values, some remarkable advances were recorded. From January to May, Atchison gained 48 points, Burlington 59¾, Missouri Pacific 47¾, Amalgamated Copper 41¾, and General Electric 49½. This upward movement culminated on May 9 in the most remarkable panic ever experienced on the New York Stock Exchange. This panic developed out of a contest for the control of the Northern Pacific Railroad between Union Pacific interests on the one side and Mr. James J. Hill and Messrs. J. P. Morgan & Company on the other. When the announcement of the Burlington purchase was made, representatives of the Union Pacific demanded that they be allowed to share in the purchase, on the ground that if the Burlington was in the hands of the Northern transcontinental lines, much traffic which it had formerly given to the Union and the Southern Pacific would be transferred to the Great Northern and the Northern Pacific. This demand of the Union Pacific was refused by Mr. Hill. Mr. E. H. Harriman and Messrs. Kuhn, Loeb & Company, representing the Union Pacific, thereupon proceeded to purchase, both in this country and in Europe, large amounts of both preferred and common

stock of the Northern Pacific Railroad, in order to gain a sufficient influence in that company to prevent it diverting Burlington traffic away from Southern and Union Pacific over its own lines. This attempt succeeded so far as the preferred stock was concerned, an actual majority of this issue passing into the hands of the Union Pacific interests. The contest was then transferred to the common stock of the Northern Pacific, a portion of which was not yet in the hands of the opposing interests, and if secured by the Union Pacific, would give that company control of the Northern Pacific. The price of Northern Pacific common, under the influence of heavy buying, rapidly advanced on May 6 from 114 to 133, on May 7 to 149¾, and on Wednesday, the 8th, to 180. A large number of speculators, in ignorance of the real situation, and knowing that the advance in the stock was not warranted by earnings, sold short to the contending interests for future delivery, expecting to borrow the stock, make their deliveries, and within a short time cover their short sales at a lower price. On Wednesday it developed, however, that there was very little Northern Pacific common stock to be either borrowed or bought, and 80 per cent. had to be paid for its use over night. The following day 300 per cent. was asked for one day's use of the stock, and the price rose to 1,000 for cash sales. At the same time the rates for money rose to prohibitive figures, as much as 75 per cent. being paid. In order to secure funds for the purchase of Northern Pacific, the "shorts" sold heavily of other securities. Large blocks of the very best stocks were pitched overboard. Brokers who were carrying large lines for their customers on margins, in order to save themselves, were obliged to sell. This rush of selling orders carried prices down rapidly. The differences between the high and low points of May prices recorded in the preceding table of quotations shows the extent of the panic. The panic ceased immediately on the afternoon of May 9, when it was announced that all short contracts could be settled by paying the difference between the selling price and 150. A syndicate of bankers and others also offered to loan large sums of money at the market rate. The reaction from the low prices of the early part of the day was immediate, and is illustrated by the following table of high, low, and closing quotations of 8 active stocks on May 9:

	High.	Low.	Closing.
Atchison	78¾	43	66¾
Chicago, Milwaukee & St. Paul.....	165	134	141
Missouri, Kansas & Texas	59	37	48
Pennsylvania	147	137	144
Southern Pacific	49	29	45½
Amalgamated Copper	116	90	106
United States Steel	47	24	40¾
United States Steel, pref.	98	69	89½

The Northern Pacific panic is unique in that it was not, like most catastrophes of this nature, caused by any unsoundness of industrial conditions or by an over-speculation in securities, but was altogether the result of a contest for the control of a particular stock. The losses incurred were enormous. Most of the margin speculators were sold out, and the public was frightened away from the market. The inherent strength of the business situation, however, was so great that the leading financial interests were able to prevent the depression which usually follows a panic, and even to advance prices, which on June 17 were but little below the high figures of May. From that time on, however, the market began to weaken. The steel strike and the prolonged drought in the West during July and August were serious depressing influences. Steel common, which had touched 52¾ in June, during July fell to 37, and only with great difficulty was held at or near 40. Reports of crop damage caused Atchison to fall during July from 89¾ to 67¾; Chicago, Milwaukee & St. Paul from 177¼ to 155½; and Rock Island & Pacific from 158½ to 130. Much of this loss was subsequently regained, but the succession of heavy blows further discouraged speculation and increased the burden of sustaining the market. In September came more depressing influences. The assassination of the President caused a small panic, which was only prevented from becoming serious by the prompt action of the clearing house committee in offering money at low rates. As it was, however, the average of 20 railway stocks declined 5.52 points and the average of 12 industrials fell 6.58. Closely succeeding this calamity came the revelation that the copper market was oversold, and that the price of 17 cents, which had enabled the Amalgamated Copper Company to pay 8 per cent. dividends, must be reduced. The Amalgamated Copper Company reduced their dividend to 6 per cent. and the stock fell from 120 to 88¾, declining still further to a low point of 60½ in December on a reduction in the price of copper to 13 cents and a further reduction of the Amalgamated dividend. The collapse of Amalgamated was a severe blow to the industrial group, largely because of the great secrecy with which their affairs are conducted. It was generally feared that if the truth were known

concerning others of the recently formed combinations, a condition similar to that of copper might be revealed. Investors lost confidence in industrials, and from September 20 to December 12 their average fell 8.86 points. Banks generally charged higher rates for loans on industrials. The situation was made still worse by the failure of the Everett-Moore syndicate of Cleveland, controlling various electric railway, electric lighting, and telephone franchises, and by the utter collapse, under highly discreditable circumstances, of the American and National Asphalt Company, controlled by Philadelphia capitalists. The stock market after September was almost wholly professional in character, the outside public persistently holding aloof. In November public confidence was revived in some measure by the announcement that the differences between the Union Pacific and Northern Pacific interests, which had brought on the panic of May 9, and which had remained potentially active since that time, had been settled. The terms of the settlement were as follows: (1) The organization of the Northern Securities Company, with \$400,000,000 of capital, to purchase by exchange of stock the Great Northern and the Northern Pacific Companies, which jointly controlled the Burlington; (2) the purchase of the Harriman and Kuhn-Loeb holdings of Northern Pacific preferred stock and its retirement by an issue of Northern Pacific bonds, convertible into the common stock of the same road; (3) the lease of the Chicago, Burlington & Quincy Railroad to a new corporation called the Chicago, Burlington & Quincy Railway, with representation in the latter to the Union Pacific interests, which were also given representation in the Northern Securities Company. The effect of this settlement in restoring public confidence was seriously impaired by the hostility which its announcement caused throughout the Northwest. Governor Van Sant, of Minnesota, announced that he would fight the consummation of the new arrangement by every means in his power, and through the attorney-general of the State brought suit in the United States Supreme Court to prevent the Northern Securities Company from voting or owning the stocks of the Great Northern and the Northern Pacific, on the plea that the formation of this company was in effect a consolidation of competing roads, and therefore not only opposed to public policy, but likely to result in serious detriment to the people of the States through which the two railways in question extended, by depriving them of the benefits of competition. The year in the stock market closed amid general anxiety and apprehension, conservative financiers freely voicing the opinion that the outlook for higher prices was not encouraging.

NEW YORK MONEY MARKET.

	RATE OF INTEREST.		Loans.	Deposits.	Surplus Reserve.	Excess of Gold Imports (+) or Exports (-) (United States)
	Call.	Time. Double name paper.				
January	1½ - 6	3½ - 5	\$803,989,600 841,367,300	\$870,950,100 937,423,000	\$14,150,075 30,799,450	(-) \$3,955,533
February	1½ - 2½	3½ - 3¾	871,808,200 911,800,400	969,917,500 1,011,329,000	12,852,450 24,858,825	+1,442,462
March	1½ - 3	3½ - 4½	914,209,400 918,719,600	1,000,458,300 1,012,514,000	7,870,500 14,861,100	+2,030,186
April	2 - 7	3½ - 4½	882,067,300 904,440,600	967,201,200 1,004,283,200	5,817,975 16,759,775	-2,667,927
May	2 - 7½	4 - 4½	858,872,600 890,450,400	941,116,900 973,111,600	8,127,475 21,268,975	-8,328,343
June	2½ - 15	3½ - 4¾	866,314,700 902,755,300	952,398,200 984,194,300	6,611,350 21,253,060	-2,084,101
July	2 - 25	3¾ - 4½	856,198,500 889,466,900	939,145,300 965,285,100	5,211,525 23,128,575	+1,200,993
August	2 - 4	4 - 4½	878,506,900 895,145,800	955,912,200 968,149,600	11,919,925 22,165,350	+3,339,667
September	2 - 10	4¾ - 5½	865,949,200 885,145,800	930,361,900 947,092,100	7,110,550 16,283,100	+11,742,069
October	2½ - 4½	4½ - 4¾	870,900,700 884,589,700	943,253,100 954,496,100	14,713,175 17,483,175	+5,525,891
November	3 - 5	4½ - 5	869,063,000 891,922,900	932,957,500 958,062,400	8,689,925 14,486,925	-8,860,822
December	2½ - 12	5	857,960,200 881,552,000	910,869,800 938,958,100	5,455,025 7,891,350	-1,952,551

The course of the money market during 1901 can be readily separated into two periods: (1) A period of easy money, large surplus reserves with expanding loans and deposits, extending from the first of January to the first of May; and (2) a period of higher and irregular rates for money, with small surplus reserves and decreasing loans and deposits. In other words, the course of the money market and the course of the stock market were almost coincident. During the early

months of the year money was abundant in spite of gold exports, and rates remained easy in spite of many calls for money. In March, for example, the Union Pacific paid \$20,000,000 for Southern Pacific stock; the Standard Oil Company declared a 20 per cent. dividend; and the syndicate managers of the United States Steel Corporation called \$25,000,000 from the underwriters, without perceptible effect upon the money market. In April, however, the steady increase in loans and deposits began to have an influence; the surplus reserve declined, and rates rose sharply. The rate of 75 per cent. on May 9 has already been noted. From that date on to the close of the year, the money market was disturbed and uneasy. The sub-treasury gained at the expense of the banks. Large amounts of currency were taken to the West, and the depleted state of the surplus reserve led to a reduction of loans from a maximum of \$902,755,300 to a minimum of \$857,960,000 in December. Deposits also showed a heavy decline. Some relief was afforded by large bond purchases by the secretary of the treasury and by gold imports, but the condition of the money market after June, in spite of the measure of relief thus afforded, was very unsatisfactory. A noteworthy feature was the anxious care with which the leading banking and financial interests guarded the market at every time of stringency. The action of the banks on May 9, in offering large sums at the market rate, thus breaking the rate from 76 per cent. to 6 per cent. for call loans, has already been noticed. In the first week in July the market seemed again to be getting beyond control when the Chase National Bank and the Northern Trust Company offered \$14,000,000 at 6 per cent. Again on Saturday, September 7, when the attack on the President had seriously unsettled confidence, the action of the clearing house committee in offering to loan \$30,000,000 at low rates undoubtedly relieved a situation which might easily have become disastrous. The money market during 1901 was helped over a number of rough places by a liberal policy in regard to loans, where a narrow and selfish policy on the part of the banks would probably have precipitated a ruinous depression. Foreign exchange was generally high throughout most of the year, owing to the disturbed condition of foreign money markets. When the rates fell off during the early autumn below the usual gold export point, much surprise was expressed that gold exports should continue. The reason assigned was that during the contest for the control of the Northern Pacific the participants had sold large amounts of exchange for future delivery, and that the fall shipments were on that account.

Foreign Trade.—The totals of imports and exports of merchandise for 1901 are presented in the following table:

	Imports.	Exports.	Excess of Exports.
January	\$69,307,080	\$136,325,601	\$67,018,521
February	64,501,699	112,957,014	48,445,315
March	75,886,834	124,473,643	48,586,809
April	76,698,131	120,754,190	44,056,059
May	78,642,703	124,567,911	45,925,208
June	68,404,657	102,774,263	34,369,606
July	73,082,435	109,452,510	36,370,075
August	73,127,217	108,027,955	34,900,738
September	66,826,813	106,989,183	40,162,370
October	81,446,763	145,659,415	64,212,652
November	72,566,271	136,455,639	63,889,368
December	79,930,453	136,943,595	57,013,142
Total	\$880,421,056	\$1,465,380,919	\$584,959,863

The significant fact of our foreign trade during 1901 is the rapid increase in monthly imports and a marked tendency toward the reduction of our favorable trade balance. The decline in exports has been especially marked in manufactured products. Thus, for the eleven months ending November 30, 1900, the total value of iron and steel exports was \$119,604,848, and for the same period in 1901, \$94,091,967. The decline of our favorable trade balance in 1901 would have been much greater had it not been for an unusually heavy exportation of breadstuffs, which for eleven months of 1901 exceeded by \$34,756,538 the exports for the same period of 1900. Other lines of manufactured exports show the same declining tendency as iron and steel products. The explanation is found in the general depression of prices abroad coinciding with an advance of prices in the United States, thus encouraging imports and checking exports.

A classification of imports and exports for 1900 and 1901 is presented in the following table:

<i>Imports.</i>		1901.	1900.
Articles of food and animals.....		\$219,934,786	\$219,338,443
Articles in a crude condition which enter into domestic industry		304,031,545	280,380,796
Articles wholly or partially manufactured for use as manufactures and mechanic arts		87,185,552	84,803,857
Articles manufactured ready for consumption.....		138,757,953	132,475,418
Articles of voluntary use, luxuries, etc.....		130,511,120	112,151,200
Total		\$880,421,056	\$829,149,714
<i>Exports.</i>		1901.	1900.
Domestic.			
Products of agriculture		\$940,246,488	\$904,655,411
Products of manufactures		395,144,030	441,406,942
Products of mining		40,416,597	39,222,902
Products of forest		50,491,255	54,481,146
Products of fisheries		7,426,664	8,074,684
Miscellaneous products		4,358,936	5,169,027
Total		\$1,438,083,990	\$1,453,010,112

The most considerable increase in imports were in crude raw materials and in articles of voluntary use and luxuries, which illustrates not only the exceptional industrial activity of the past year, but also the general increase in material well-being. In exports the greatest advance occurred in the class of agricultural products, mainly due to the considerable advance in the prices of breadstuffs and meat products. The decline in manufactured exports has already been indicated and illustrated by the falling off in iron and steel. The failure of mineral exports to show a material advance is noteworthy. The hopes entertained of a substantial increase in coal exports were disappointed, the total amounting to 6,932,659 tons for eleven months of 1901, as compared with 7,145,039 tons for the corresponding period of 1900.

Prices, Bank Clearings, Railroad Earnings, and Internal Commerce.—The prices of 20 staple commodities, as compiled by *Bradstreet's*, are represented in the following table:

	Jan. 1st.	Feb. 1st.	Mar. 1st.	April 1st.	May 1st.	June 1st.	July 1st.	Aug. 1st.	Sept. 1st.	Oct. 1st.	Nov. 1st.	Dec. 1st.	Jan. 1st.
Wheat, No. 2, red winter.....	\$.8025	.79	.785	.79	.808	.81	.722	.732	.75	.74	.765	.812	.87
Corn, No. 2, mixed.....	.467	.46	.47	.485	.492	.537	.496	.488	.587	.613	.617	.633	.686
Oats, No. 2, mixed.....	.282	.30	.31	.315	.322	.33	.327	.38	.385	.382	.425	.49	.52
Flour, straight winter, per bbl.....	3.50	3.45	3.40	3.40	3.45	3.45	3.35	3.20	3.30	3.35	3.30	3.45	3.60
Beef, best, native steers, Chicago, per 100 lbs.....	6.00	6.00	5.90	6.00	5.95	6.00	6.50	6.25	6.20	6.35	6.75	7.00	7.25
Sheep, prime Chicago, per 100 lbs.....	4.70	4.60	5.00	5.40	5.00	4.65	4.20	3.95	3.95	3.90	4.05	4.25	4.25
Hogs, prime Chicago, per 100 lbs.....	5.00	5.25	5.40	6.20	5.85	5.90	6.00	6.00	6.50	7.00	6.00	6.20	6.60
Cotton, Middling uplands, per lb.....	.108	.10	.091	.081	.083	.082	.088	.080	.086	.081	.088	.08	.084
Wool, Ohio and Pa. X, washed (Boston), per lb.....	.25	.25	.24	.24	.24	.24	.24	.24	.24	.24	.24	.24	.24
Silk, best No. 1 flature, per lb.....	3.45	3.40	3.45	3.55	3.50	3.55	3.70	3.70	3.90	3.95	3.85	3.70	3.70
Sugar, granulated, per lb.....	.065	.065	.0625	.0645	.0555	.065	.0645	.0625	.061	.06	.061	.049	.0475
Coffee, Rio, No. 7, per lb.....	.071	.07	.075	.067	.061	.062	.08	.066	.066	.067	.064	.068	.071
Pig Iron, No. 1, Foundry, New York, per ton.....	16.75	16.50	16.75	16.75	16.50	16.25	15.60	15.50	15.25	15.40	15.50	16.25	16.75
Steel billets (Bessemer), per ton Pittsburg.....	19.75	19.75	22.00	24.00	24.50	25.00	24.50	24.00	25.00	26.00	27.00	28.00	27.50
Copper, Lake Superior ingots, New York, per lb.....	.168	.167	.17	.17	.17	.17	.167	.165	.165	.165	.165	.166	.122
Lead, pig, New York, per lb.....	.43	.43	.43	.43	.43	.43	.43	.43	.43	.43	.43	.43	.39
Coal, anthracite, stove sizes, New York, per ton	4.50	4.50	4.50	4.25	4.10	4.20	4.30	4.40	4.65	4.50	4.50	4.50	4.50
Bituminous, Pittsburg, f. o. b. Chicago, per ton	3.25	3.25	3.25	3.15	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.45	3.45
Connellsville Coke, furnace, per ton.....	1.75	1.75	1.75	1.75	1.75	1.75	1.75	2.00	1.75	1.75	1.75	1.75	2.25
Petroleum, crude in barrels, New York, per bbl.....	1.20	1.17	1.28	1.27	1.15	1.05	1.05	1.25	1.25	1.30	1.30	1.30	1.15

The general tendency of prices has been upward. The advance in breadstuffs and meat products was mainly due to the shortage in the corn crop. The advance in iron, steel, and coal is a reflection of the unparalleled industrial activity of 1901, a severe car shortage during the autumn months having materially contributed to bring about a scarcity of coal. The metal market was adversely affected toward the close of the year by the decline in copper, which depressed tin and lead. Sugar showed the effect of fresh competition between the trust and the independent refiners. The decline in cotton was mainly the result of a decrease in the foreign demand. The index number of *Dun's Review*, arranged by classes of commodities, gives a general view of the price movement:

	Bread- stuffs.	Meats.	Dairy and Garden.	Other Food.	Clothing.	Metals.	Miscel- laneous.	Total.
1901.								
January.....	\$14,456	\$8,407	\$15,556	\$9,504	\$16,024	\$15,810	\$15,881	\$95,668
February.....	15,062	8,592	13,866	9,418	16,271	15,845	15,966	95,010
March.....	15,070	8,696	13,898	9,396	15,460	15,875	16,471	94,866
April.....	15,221	9,294	13,519	9,208	14,991	15,048	16,629	94,910
May.....	16,112	9,251	14,983	9,154	14,945	15,179	16,596	96,220
June.....	15,635	9,224	13,161	9,116	14,882	15,249	16,532	93,799
July.....	14,904	9,430	11,080	9,086	15,098	15,344	16,617	91,509
August.....	16,668	9,151	13,261	9,253	15,027	15,345	16,625	95,380
September.....	17,369	9,530	13,009	9,153	15,234	16,091	16,625	96,911
October.....	17,146	9,517	13,164	9,190	15,279	15,760	16,835	96,891
November.....	17,840	9,929	13,622	9,157	15,342	15,876	16,977	97,743
December.....	19,528	9,259	15,675	9,061	15,331	15,722	16,782	101,378
January (1902).....	20,002	9,670	15,248	8,952	15,547	15,375	16,798	101,567

It appears from this table that the farming population secured the largest share of the gains from advancing prices. The rise in breadstuffs was about 38 per cent., in meats 15 per cent.; manufactured products scored much smaller advances. The net rise in general prices was 7 per cent. The result of the advance in the prices of foodstuffs was to raise materially the cost of living to the laboring and artisan class. This increased cost of living, however, was largely compensated for by full employment for all classes of labor. The business activity of the year was unparalleled. The tables of bank clearings and railway gross earnings furnish the best evidence of the general prosperity:

Bank Clearings at Twenty Principal Cities.

	1901.	1900.
New York	\$79,427,685,837	\$52,634,201,865
Chicago	7,750,372,450	6,799,535,598
Boston	7,191,685,110	6,180,308,447
Philadelphia	5,475,345,188	4,677,655,906
St. Louis	2,270,737,216	1,688,849,495
Pittsburg	2,046,605,963	1,615,379,044
Baltimore	1,191,867,587	1,191,867,587
San Francisco	1,165,250,091	1,165,250,091
Cincinnati	972,502,450	972,502,450
Kansas City	918,198,612	918,198,612
Cleveland	702,768,639	565,863,286
Minneapolis	626,020,452	579,994,071
New Orleans	602,264,116	556,790,701
Detroit	575,481,632	428,800,385
Louisville	462,060,845	424,555,518
Indianapolis	430,171,791	326,819,577
Providence	349,328,200	326,289,700
Omaha	334,102,066	318,537,040
Milwaukee	327,533,756	298,411,922
Buffalo	302,857,979	259,312,562

These figures show a substantial increase in general business for every part of the country. It is important, however, to observe that while the total clearings of the entire United States increased from 85.7 billion dollars to 117.0 billion dollars, or 37.6 per cent., the clearings outside of New York increased only from 33.1 billion dollars to 38.5 billion dollars, or 16.4 per cent. These outside clearings mainly represent the record of industry and trade as distinguished from the record of speculation, while New York clearings include the record of the Stock Exchange.

The improvement in general business is more accurately reflected by the figures of railway gross earnings:

GROUPS OF RAILWAYS.	GROSS EARNINGS.		Increase.	PER CENT OF INCREASE.	
	1901.	1900.		1901 OVER 1900.	1900 OVER 1899.
Trunk.....	\$ 344,162,108	\$ 316,776,296	\$ 27,385,812	8.6	22.4
Anthracite coal.....	129,618,381	111,028,747	18,589,634	16.7	6.3
Other Eastern.....	100,765,008	95,022,280	5,742,728	6.0	13.3
Central Western.....	115,171,390	104,800,890	10,370,500	10.1	24.9
Grangers.....	181,760,089	169,834,732	12,425,357	7.3	12.3
Southern.....	184,024,636	181,461,346	2,563,290	7.1	21.7
South-Western.....	177,994,266	182,139,426	25,254,840	17.0	24.0
Pacific.....	181,429,451	159,555,870	21,873,581	18.7	30.1
U. S. Roads.....				10.7	20.3
Canadian.....				12.8	17.3
Mexican.....				0.1	12.9
Total.....	\$1,492,782,948	\$1,324,286,533	\$168,496,415		

The greatest advances, it appears from the foregoing table, occurred in Central and Southwestern States and in the Pacific States, but every part of the country shared in the prosperity. The evidence of general prosperity afforded by clearings and railway earnings is confirmed by the record of lake commerce:

Receipts of Freight at Lake Ports for 1901 and 1900.

	1901.	1900.
Coal (tons):		
Anthracite	3,371,254	2,272,456
Bituminous	5,834,510	4,330,485
Flour (barrels)	14,257,020	12,670,890
Wheat (bushels)	63,632,337	52,985,076
Corn (bushels)	37,127,511	71,016,761
Iron ore (tons)	19,429,546	16,769,510
Iron manufacture (tons)	359,692	168,059
Salt (tons).....	666,692	487,932
Copper (tons)	127,050	154,271
Lumber (M. feet)	2,361,016	2,161,043

With the exception of corn, which was in short supply, and copper, which was held off the market, the movement of these staple commodities showed a substantial increase. Distribution shared equally with production in the general prosperity.

From reports to *Dun's Review*, the following summary has been prepared showing statements of conditions in different lines of merchandising and manufacturing business at various cities during 1901, and also, where given, comparison with results of 1900:

Merchandising.	Boston.	Philadelphia.	Baltimore.	Cincinnati.
Drygoods.....	All branches unusually prosperous.	Increase.	Equal to 1900.	Slight Increase.
Cloaks and suits (cloth- ing).....		Increase. +15-20 per cent.	+20 per cent.	Slight Increase.
Boots and shoes.....		Builders+33 pr ct.	+20 per cent.	+2.3 per cent.
Hardware.....		Equal to 1900.	+20 per cent.	Slight Increase.
Groceries.....		Increase.	Slight gain.	.....
Drugs, paints, and oils..				
	Cleveland.	Detroit.	St. Louis.	Kansas City.
Dry Goods.....	+14 per cent.	+10-25 per cent.	+30 per cent.	+17-30 per cent.
Cloaks and suits (cloth- ing).....	+16 per cent.	.....	Hats+12 per cent.	.....
Boots and shoes.....	+14 per cent.	+10-15 per cent.	+15 per cent.	10-40 per cent.
Hardware.....	+17 per cent.	.....	.....	Increase.
Groceries.....	+12 per cent.	+15-25 per cent.	.....	Increase.
Drugs, paints, and oils..	+20 per cent.	.....	.....	Increase.

DANIEL K. PEARSON.

J. PIERPONT MORGAN.

ANDREW CARNEGIE.

Reports from all parts of the country indicate great activity in building operations. In New England the estimated cost of new buildings and engineering enterprises was \$200,000,000, 100 per cent. increase over 1900. In Philadelphia, during 11 months, \$26,711,190 were expended for building, \$7,525,175 in excess of the amount for 1900. In Baltimore the cost of new buildings and improvements was \$4,373,647, as compared with \$3,570,771 in 1900. The general results of 1901 are summed up by *Dun's Review* as follows:

"Superlatives of the most emphatic kind are needed in delineating the financial and commercial progress of this nation during 1901. Despite the elements, strikes, speculative panics, foreign disasters, and the assassination of President McKinley, the first year of the new century was productive of many new high records of prices, output, and distribution. It was in this last respect that results were most satisfactory; for prices have often been inflated beyond reason, and heavy production exceeded needs until accumulated stocks caused disastrous reactions. In the year just ended, however, the unparalleled output of manufactured goods did not result disastrously, consumptive demand not only keeping pace with, but often running far ahead, of available supplies. Phenomenal shipments brought the greatest railway earnings ever attained, yet the year closed with congestion at many points because transporting facilities were utterly inadequate. Bank exchanges, the best measure of trade after making due allowance for speculative activity, far surpassed all previous records. Labor disputes were numerous and stubborn, yet all reached amicable conclusion with less bloodshed and destruction of property than in earlier years, while the formation of a committee of conciliation promises fewer prolonged controversies hereafter. The new year opens most auspiciously, and the rising tide of prosperity should bring many new high-water marks."

FINE ARTS. See ARCHITECTURE, PAINTING, SCULPTURE, and MUSIC.

FINLAND, a Russian province on the Gulf of Bothnia, has an area of 144,255 square miles, of which over 11 per cent. is under lakes, and a population of about 2,700,000, of whom about 83 per cent. are Finns. The largest city and capital is Helsingfors, the population of which (with Sveaborg) numbers about 85,000. Over 90 per cent. of the inhabitants are Lutherans. In education and in the general advancement of civilization, Finland is superior to the other parts of Russia. Except along the eastern frontier there are scarcely any illiterates.

Government and Finance.—As a grand duchy Finland had a constitution, and this, though of late violated by Russian authority, still continues. It provides for a diet and a senate. Members of the latter, which is the chief administrative power, are nominated by the crown, and its president is the governor-general of the province. The departments of war and of foreign affairs are directly under the Russian authorities at St. Petersburg. The estimated revenue and expenditure for 1899 were reported to balance at 88,508,916 marks. The public debt amounts to 115,028,841 marks. The value of the Finnish mark is 19.3 cents.

Industries, Commerce, etc.—The principal crops are rye, barley, oats, and potatoes. The forests are very extensive, and large quantities of timber and wood-pulp are exported; the wood-pulp industry in recent years has greatly increased. Iron production is important, and there are a number of successful manufacturing industries. The trade of Finland is not included with that of Russia proper, and it has different and, in general, much lower tariffs. The imports and exports in 1899 were valued at 251,000,000 marks and 184,900,000 marks respectively; in 1900, 270,800,000 marks and 197,700,000 marks respectively. In the former year the leading exports were: Timber, 98,200,000 marks; butter, 23,600,000, and wood-pulp, paper, and cardboard, 17,700,000. The chief imports in 1899 were: Cereals, 53,300,000 marks; iron, iron-ware, and machinery, 32,700,000; woollen goods, 12,100,000; cotton goods, 11,800,000, and sugar and coffee. The greater part of the trade is carried on with Russia, Germany, and Great Britain. There are about 1,600 miles of railway, almost all of which is owned by the state. It was for railway construction that the public debt was incurred.

History.—The "Russification" of Finland has gone steadily forward since the grand duchy was made a Russian province by the imperial edict of February 15, 1809, and so thoroughly is Russian authority being introduced that the recent remark of General Bobrikoff, the Russian governor-general, "Finland is merely a geographical conception," unlike Metternich's similar saying concerning Italy, contains a solemn truth. In the edict just mentioned the czar said: "We have found it necessary to reserve to ourselves the ultimate decision as to which laws come within the scope of the general legislation for the empire," while at the same time the governor-general was given the right to veto any law enacted by the Finnish diet. Accordingly this body is deprived of its constitutional powers. By the ukase of June 26, 1900, the Russian government authorized the gradual introduction of the Russian language in all the official departments and public offices of Finland; thus, within a period of five years all Finns ignorant of Russian would be debarred from office

and the positions of course filled by Russians. How far-reaching in its consequences is this edict may be seen in the fact that out of the total population only about 8,000 persons—and those are chiefly along the Russian border—are able to speak Russian. Then followed a sweeping censorship which prohibited even the publication of the proceedings of the diet; as compared with 40 interferences with the press in 1897 and 12 in 1898, there were 375 in 1899 and nearly 1,000 in 1900. This censorship continued throughout 1901; in May it was reported that the censors had been ordered to prevent the publication of complaints or criticism against the police and of reports of trials of persons making such charges. About the same time it was announced that the senate had been ordered by the czar to prohibit the use of Finnish postage stamps, which for some time, as an expression of national feeling, had been used in addition to the Russian stamps. Very soon after his accession to power, General Bobrikoff prohibited any meetings for political or economic discussion, and more recently severer restrictions have been placed upon the formation and assemblage of societies, including scientific and literary bodies. The Russian government also has interfered with religion and education in Finland. Although there are only some 45,000 members of the Orthodox Church in the province, no one not a communicant of that church may hold office in the higher administrative departments, while throughout the country Russian churches, supervised by Russian priests, have been established. A reform in the school system of Finland, a country preeminent for its literacy, by a government which has seldom shown itself kindly disposed toward education, and of whose subjects, moreover, nearly 60 per cent. are unable to read and write, seems an anomaly. But the gradual substitution of the Russian language for the Finnish in all elementary schools has begun, and since few Finnish teachers know Russian, it will not be long before they will be replaced by Russian teachers and all the children of the province subjected to Russian influence. In the higher schools a study of Russian has been made compulsory, and the hours devoted to the study of Russian history, geography, and religion have been extended. A Russian has been appointed to the chancellorship of the famous University of Helsingfors, and it was reported in the fall of 1901 that, pursuant to a governmental edict, Russian would supersede Swedish and Finnish as the language in which lectures are delivered at that institution. Few of the professors are proficient in Russian; and so the university, like the schools, will become Russian both in language and in teaching corps.

Some surprise was occasioned late in February, 1901, by the defeat in the Russian council of state, by a large majority, of the project of "Russifying" the Finnish army. This defeat, which was temporary, appeared to be brought about largely through the efforts of M. Witte, the Russian minister of finance, whose influence is gradually embracing all departments of governmental administration. It was pointed out, however, that the council of state, though the highest administrative institution in Russia, is merely a consultative body, "whose opinion can be and often has been set aside by the sovereign without the least difficulty." This seems to have been the case in 1901; for on July 11 an imperial edict was promulgated, according to which the Finnish militia, which formerly could not be sent outside of the province, and which was commanded by Finnish officers, became a part of the Russian army, commanded by Russian officers in the Russian language, and liable to be sent to any part of the empire. The annual quota was raised from 1,920 men to 7,200 men between the ages of 20 and 22, and the time of active service was extended from 3 to 5 years. This means that Finland must maintain an active army of 36,000 young men, the loss of whose labor is already keenly felt. Formerly emigration from Finland was very small, but notwithstanding severe restrictions, 16,000 young men left the country in 1899 and 36,000 in 1900. This edict was laid before the Finnish senate, and, though clearly opposed by that body and notwithstanding its apparent unconstitutionality, was approved on August 1. At the same time the senate solicited the czar to assure the maintenance of Finland's local institutions. The czar's reply, through the secretary of state for Finland, seemed to be a severe rebuff, stating that "his Majesty does not find the present occasion suitable to address, as the senate desires, to the Finnish people new assurance as to the maintenance for the future of their local institutions. As to his Majesty's good intentions in this respect, his faithful subjects cannot be in doubt. The disquieting apprehensions which are now by evil-minded people being disseminated among the population point to the necessity of securing public order by means of administrative measures." Among other things, "administrative measures" seem to mean the suspension of legal trial, and it was pointed out that the four senators who voted against the promulgation of the military service law had been summarily dismissed because they "failed to comply with his majesty's orders and commands." As an outcome of a meeting of the diet in August a petition to the czar, signed by 471,131 persons, was laid before the senate on September 30. The petition characterized the new military law as "a far-reaching infringement of the fundamental laws of the grand duchy," and went on to state that the Finns had shown their "readiness to

FIRE EXTINGUISHING APPARATUS.—Fire Engine of 1901

Courtesy International Fire Engine Co.

increase in proportion to their strength Finland's share in the defense of the empire," but that while they were not petitioning "for any alleviation in the present military burden," they could only hold that the new military law "manifested a distrust for which the Finnish people," during nearly a century's union with Russia, had "in no way given occasion."

FIRE PROTECTION. The danger of overhead trolley and electric wires to firemen, when fighting fires, was discussed in a paper read by Morris W. Mead, superintendent of the Bureau of Electricity of Pittsburg, before the International Association of Fire-Chiefs, at their 1901 meeting in Indianapolis. Mr. Mead contended that all electrical circuits should be run in parallel, and at regular intervals run off to switches, and that such locations should be numbered and blue prints of every switch and of the location of every circuit should be prepared and kept on file at the headquarters of the fire department. The firemen should be trained in handling the switches, as well as in general electrical principles, so as to understand the easiest and safest way of operating them in case of emergency. Trolley wires should be arranged on the same principle, so they may be cut out at every 1,000 or 2,000 feet in crowded cities, and these cut-outs should be carefully marked and records of them placed on file at department headquarters. In the larger cities, one or two electricians should be attached to the fire department and go to all fires, to assist and to instruct the members of the department in self-protection from high potential currents. Another arrangement which Mr. Mead suggested for the protection of firemen was that all electric light and power companies, including trolley lines, should have thoroughly equipped wagons, located at reasonable intervals along their lines, with competent men in charge, to respond in every case of fire. Gongs connected with the fire department lines should be at all such wagon stations, and, if necessary, there should be two crews attached, to relieve each other, or else to sleep there regularly, as firemen do, and answer calls both day and night. A more radical remedy was also suggested, that cities compel all wires to be placed underground, at least in the business portions and on the main avenues.

The legal aspect of the relation between fire protection and an adequate water supply has again been brought to the front by the failure of the Greensboro Water Supply Company, at Greensboro, N. C., to furnish sufficient fire service during a fire which destroyed a hotel, in June, 1899. The water company was sued for \$40,000 damages and early in 1901, in a jury trial, \$25,000 damages was awarded against the company.

Perhaps the most notable additions, in the way of fire fighting equipment, made during 1901 were the seven steam fire engines built by the Mansfield (Ohio) Machine Works for the city of Cleveland. The steam cylinders of these engines are $7\frac{3}{4}$ inches in diameter, the water cylinders $4\frac{3}{4}$ inches in diameter, and the stroke 8 inches. The results of the tests of five of these engines were about the same. The fifth engine gave the following results: In all the trials the hose used was $2\frac{1}{2}$ inches in diameter and 150 feet in length. With one line of hose, a $1\frac{1}{8}$ -inch fire nozzle, and 135 pounds of steam pressure, water was thrown a distance of 255 feet. Under the same conditions, but with two lines of hose and 200 pounds water pressure, a stream was thrown 240 feet. With one line of hose, same size and length as above, but with a $1\frac{1}{4}$ -inch nozzle, 130 pounds steam and 265 pounds water pressure a stream was thrown 275 feet. In the next two trials two lines of hose, each 100 feet long, were "siamesed" or connected to one length of 50 feet of hose. On applying a steam pressure of 130 pounds and a water pressure of 240 pounds, water was thrown to a distance of 263 feet through a $1\frac{1}{2}$ -inch nozzle and with a $1\frac{3}{4}$ -inch nozzle and 210 pounds pressure, the steam conditions being the same, water was thrown 250 feet.

FISH AND FISHERIES. The Second International Conference for the Exploration of the Sea, which is actually a conference for the scientific study of fishery questions, met at Christiania, Norway, during the second week of May, 1901. Delegates were present from all the countries of northern Europe, and also from Great Britain, and among them were a number of well-known biologists. The work was chiefly the revision and completion of the programme adopted at the first conference, held in Stockholm two years before. This programme falls under two headings, "Hydrography" and "Biology." The former was easily disposed of, but the biological programme was finally recast and caused much discussion, although every decision reached was harmonious. The organization of the scheme of international research was completed only in part, since several points required reference to the governments concerned. The biological programme adopted includes the biology of food fishes, their distribution in all stages of growth, their life histories, migrations, etc.; the quantitative distribution of pelagic eggs, larvæ, and young fishes, the collection of material showing local varieties of plaice, herring, and mackerel; the study of the plankton and bottom fauna, especially with reference to the nutrition of food fishes; and lastly, the elaboration of fishery statistics so as to yield data for making maps of the fishing grounds, and for determining the influence of physical conditions

on fish. The Conference proposed the establishment of an international council, a central bureau, and an international laboratory, to direct the operations, and it urged the governments interested not only to undertake the support of these bodies, but also to provide steamers to carry on the work. It was further urged that the programme be carried out for not less than five years, beginning in the spring of 1902.

As shown by the interest in this conference, the importance of fisheries is coming to be more and more clearly seen in Europe. The United States has long given special attention to the subject, and our fisheries are in excellent condition, but in Great Britain there is much complaint over the condition of the industry. The year 1901 saw much discussion of the situation, and it was stated that Parliament is uninterested and is unwilling to appropriate funds necessary for ascertaining the facts. It is claimed that trawling is ruining the fishing grounds, and scientific methods of replenishing them are not used. Moreover, it is said that the protection of gulls and other sea-birds is resulting in a great increase in their numbers, and as they are fish-feeders, their competition is really being felt by the fishermen. In other countries, however, investigations into the condition of the fisheries have been carried on with marked success. The marine resources of the West Indies were carefully considered at a conference held in Barbados early in 1901. The yearly value of the fish caught in Jamaica alone is about \$150,000, while nearly five times that amount is imported. It is urged, that with improved methods of fishing, the local supply might be greatly increased. The feature of the conference was the paper by Dr. J. E. Duerden, on *The Marine Resources of the British West Indies*. This has been published in pamphlet form, and is a valuable contribution to the literature of the fishing industry. It shows conclusively what the government ought to do to put that industry on a firm foundation in the West Indies. During 1901 our own government investigated the marine resources of the Hawaiian Islands (see ZOOLOGICAL EXPEDITIONS). The results are not yet tabulated, but there is reason to believe that the investigations will lead to great improvements in the methods used and in the results obtained.

The fish and fisheries of Japan were the subject of a very large amount of literature during 1901. It will be remembered that during 1900, Dr. Jordan and Dr. Gilbert visited Japan and made extensive collections of fish. The *Albatross* also collected there, and other collections came into the hands of Jordan and Gilbert, who have now published a large part of their results. Dr. Jordan has also published accounts of the geographical distribution of Japanese fishes, but some of his conclusions have not met with universal acceptance. About 1,100 species of fish are recognized by Jordan as occurring in Japan, of which only 50 are fresh-water. The latter are all distinctively Asiatic. The marine fishes occur in five fairly distinct faunal areas, of which the northernmost is clearly sub-arctic, while the two southernmost are tropical, one of them showing Polynesian and the other East Indian features. Another contribution has been made to our knowledge of the fish fauna of Lake Tanganyika, and the remarkable fact has been brought out that the former connection of that lake with the ocean was probably not to the northeastward, as had been surmised, but westward through the valley of the Congo. About 90 species of fish are known from Tanganyika and Kivu, of which 75 were new to science when first taken in those lakes.

It is worth noting that the smallest known fish and the largest known deep-sea fish were both described during 1901. The former is not only the smallest known fish, but the smallest of vertebrates, for the adults measure from 10 to 15 mm. in length, the average being less than 13 mm. It is found only in Lake Buhi, Luzon, but is extremely abundant there, and although so small it is an important article of diet among the natives. It has been named *Mistichthys luzonensis* by Dr. H. M. Smith, the name meaning *smallest fish of Luzon*. The largest deep-sea fish was captured by the *Albatross*, off the coast of southern Chile, at a depth of 1,050 fathoms, and was about 5 feet long. Unfortunately, after a photograph of it had been taken, the fish was accidentally thrown overboard and lost. The capture was made some years ago, but the description has only just been published by Gill and Townsend, under the name *Macrías amissus*, which refers to the large size and the lost specimen. Early in 1901 some observations of much interest were published on the food of the cod. An examination of several hundred stomachs showed that the food is almost wholly made up of crustaceans, chiefly *Panopeus*, but hermit crabs and young lobsters were found. The presence of the latter may throw some light on the great decrease of lobsters in recent years; for, thanks to the United States Fish Commission, the number of cod-fish has greatly increased.

In this connection it is proper to mention the important work, begun by the Commission in 1900, and continued during the past year, on the artificial culture of lobsters. The great difficulty has always been to keep the young alive. Usually they become covered with parasites and die. Various inclosures have been tried with

FIRE EXTINGUISHING APPARATUS.—Hose Wagon of 1901.

more or less success, but the best are large bags of scrim, 3 feet in diameter, and 4 feet deep, in which the water is kept agitated either by the tides or artificially. It has been found that the most important thing is to keep the young off the bottom. Growth is rapid, and the so-called "lobsterling" stage, which occurs after 3 moults, may be reached in 9 or 10 days. The work during the summer of 1901 proved very encouraging, and great hopes are entertained by those in charge that it will be possible to replenish the depleted waters of the New England coast with an abundance of healthy young lobsters. Along other lines the Commission has had a successful year, although little of the routine work is reported in current literature. The *Fish-Hawk* has been employed along the east coast of the United States, at Wood's Hole, Beaufort, and in Florida, while the *Albatross* has been for a large part of the year among the Hawaiian Islands. The records of the work of the *Albatross* were published during 1901. They cover the eighteen years she has been in commission. During that time she made 1,786 hauls of the dredge and trawl, at depths varying from less than 100 to more than 4,100 fathoms. The greatest depth (4,173 fathoms), is the deepest dredge haul ever made. She has also made more than 4,000 soundings, giving character of the bottom as well as depth. Nearly 2,000 species of animals, largely deep-sea fishes and crustaceans, new to science, have been collected by the *Albatross* and many have been described. For accounts of the work of the *Albatross* during 1901, and the work of the Fish Commission stations at Wood's Hole and Beaufort, see ZOOLOGICAL EXPEDITIONS AND STATIONS.

FISKE, JOHN (EDMUND FISKE GREEN, the name Fiske being that of his maternal grandfather), American historian and philosopher, died at Gloucester, Mass., July 4, 1901. He was born at Hartford, Conn., March 30, 1842, and graduated at Harvard College in 1863. Although a graduate of the Harvard Law School (1865) he never practiced, choosing rather to pursue a scholar's career. In 1869 he became lecturer in philosophy at Harvard and an instructor in history in 1870, and from 1872 to 1879 was an assistant librarian of the college. At 19 he had attracted attention by an article in the *National Quarterly Review* on *Mr. Buckle's Fallacies* (1861), and from that time he occupied a prominent place among the American advocates of the theory of evolution and the Spencerian philosophy, his *Cosmic Philosophy* being probably the clearest exposition of these doctrines ever published. His discovery of the causes of the prolonged infancy of mankind, and the part played by it in determining human development (1871), was one of the most important contributions to the Darwinian theory. After 1871 Mr. Fiske was best known for his lectures on American history, which he delivered throughout this country and Great Britain, and for his publications dealing with the same subject. He lectured at University College, London, in 1879 and at the Royal Institution of Great Britain in 1880. In his historical writings he was an avowed popularizer rather than a thorough investigator. While not a final authority, therefore, he nevertheless infused into his work a spirit genial and broad enough to make it readable for its own sake instead of merely as history. He covers the history of the United States from the earliest discoveries to the year 1789 in a clear, minute style, and may be said to have done more than any other historian to spread the story of that period. Mr. Fiske occupied a place in American literature notable for the character of his labors, his prodigious industry, and a magnetic personal charm that endeared him to all who met his influence. He was a joint editor with James Grant Wilson of *Appleton's Cyclopaedia of American Biography* (6 vols., 1887-89); and his other works include *Myths and Myth-makers* (1872); *Outlines of Cosmic Philosophy, Based on the Doctrine of Evolution* (1874); *The Unseen World* (1876); *Darwinism and Other Essays* (1879); *Excursions of an Evolutionist*, (1883); *The Destiny of Man Viewed in the Light of His Origin* (1884); *The Idea of God as Affected by Modern Knowledge* (1885); *The Critical Period of American History* (1888); *The Beginnings of New England* (1889); *The American Revolution* (2 vols., 1891); *The Discovery of America* (2 vols., 1892); *History of the United States for Schools* (1894); *Old Virginia and Her Neighbors* (2 vols., 1897); *Dutch and Quaker Colonies* (1899); *The Mississippi Valley in the Civil War* (1900); *Through Nature to God* (1900); *Life Everlasting* (1901); and, posthumous, *The French and English in America*.

FITZGERALD, GEORGE FRANCIS, F.R.S., professor of natural and experimental philosophy in the University of Dublin, died February 21, 1901. He was born in Dublin in 1851, and received his education at Trinity College, Dublin, where he graduated in 1871. Becoming a fellow in 1877, he served as tutor until 1887, when he was appointed professor of experimental philosophy. He devoted himself to theoretical and experimental investigation, and in 1878 published an important memoir *On the Electromagnetic Theory of the Reflection and Refraction of Light*, which is considered a classic among the works of modern physical science. In 1899 he received one of the royal medals of the Royal Society, of which he had been elected a fellow in 1883. He was also a member and for many years secretary of the Royal Dublin Society. His researches dealing with the electromagnetic theory of light did much

to promote the study of that subject, and he was considered one of the leading mathematical physicists of the nineteenth century.

FLAX. In the United States flax is grown almost exclusively for the seed, from which linseed oil is made. Sometimes the straw, which is generally inferior, is used in tow or paper mills. The estimated area under flax in 1901 was considerably over 3,000,000 acres, and the crop—the largest ever produced in this country—was about 26,000,000 bushels. This was raised chiefly in North Dakota, Minnesota, South Dakota, Kansas, and Iowa. The production of British India in 1901 is stated at 8,625,547 bushels. The world's crop for 1900 is reported at 64,466,500 bushels, as against 61,726,600 bushels in 1899 and 72,938,500 bushels in 1898. Of the 1900 crop 32 per cent. was produced in Russia, 31 per cent. in the United States, 18.6 per cent. in India, and 13.75 per cent. in Argentina. Of these countries, Russia alone gives attention to the production of flax fibre. The world's fibre crop of 1900 amounted to 1,312,709,000 pounds (of which about 77 per cent. came from Russia), as against 1,139,077,000 pounds in 1899 and 1,780,693,000 pounds in 1898. In 1901 the United States imported 6,878 tons of fibre valued at \$1,880,717, as against about 7,000 tons in 1900 valued at \$1,646,274. Scarcely any of the forty to fifty million gallons of linseed oil produced in the United States is exported. There has been in recent years a very great decline in flax production in France and Ireland.

FLINT. This is a commercial term for quartz which is used in the manufacture of whiteware, porcelain, and other high-grade clay products. The production of crude flint in the United States in 1900 amounted to 18,611 short tons, valued at \$134,553, while the ground material was 13,884 short tons, valued at \$44,798. This does not represent the total consumption, for much flint is imported from England and France in the form of flint nodules, which are ground after reaching this country.

FLORIDA, the southernmost State of the United States, has an area of 56,680 square miles. Florida was organized as a territory, March 30, 1822, and admitted as a State, March 3, 1845. The capital is Tallahassee. The population in 1900 was 528,542, while in June, 1901, as estimated by the government actuary, it was 543,000. The populations of the four largest cities in 1900 were: Jacksonville, 28,429; Pensacola, 17,747; Key West, 17,114, and Tampa, 15,839.

Finances.—The receipts of the treasury for the year ending December 31, 1901, were \$1,480,909.86. On December 31, 1901, the State debt, which was neither increased nor diminished during the year, amounted to \$1,032,500, all of which was bonded. The tax rate for 1901, which will hold for 1902, was 5 mills per \$1, made up as follows: Revenue for general expenses of State, 2½ mills; revenue for schools, 1 mill; revenue for pensions, 1 mill, and revenue for health department, ½ mill. The total value of State property in 1901, as returned for taxation, was \$97,551,192.17.

Industries.—The census reports of 1900 indicate a steady growth in manufacturing interests in Florida since 1850, although agriculture and the exploitation of mineral resources are the principal industries of the State. Since 1850, the population has increased from 87,445 to 528,542, and the average of industrial wage-earners from 991 to 37,094, embracing in 1900 7 per cent. of the entire population. In the latter year the amount of actual capital, exclusive of capital stock, invested in 2,115 establishments reporting, was \$34,473,997, the gross value of the products \$38,189,894, and the net value, exclusive of products re-used in the process of manufacture, \$29,235,085. The most important manufactures of Florida are due, first, to her forests, and secondly, to her tobacco fields, coupled with the large immigration of Cuban tobacco-makers. The tobacco manufacture ranks first in importance in the State, with a product in 1900 valued at \$10,891,286, as compared with \$8,123,220 in 1890. Havana tobacco is used for the most part, more tobacco leaf entering at the port of Tampa than at any other port except New York in 1899-1900. Florida tobacco is also largely used, the Cuban "filler leaf" grown there bringing the highest price of any domestic filler leaf, while the so-called Sumatra "wrapper leaf" grown in Florida was rated at the Paris Exposition higher than that grown in Sumatra. Rich veins of phosphate rock were discovered in the State in 1888, and in 1889 the production had become nearly one-half the total production of the country, 440,000 tons of this being exported. Increasing quantities are being retained in the State for manufacture into fertilizers, the product in 1900 being valued at \$555,394, as against \$86,137 in 1890.

Forests and Forest Products.—The most valuable natural resource of Florida is its forests, estimated to cover 25,000,000 acres, and composed largely of pitch pine, from which turpentine is produced, and of live oak, used in shipbuilding. In 1900, the value of the products of the industries dependent upon the forests amounted to \$18,897,495, or 49.5 per cent. of the total value of the products of the State. The items of this total were: Lumber and timber products, \$10,848,403, an increase of 96.7 per cent. since 1890; the manufacture of tar and turpentine, \$7,794,101, as com-

pared with \$191,859 in 1890; and shipbuilding, \$254,991, an increase of more than 200 per cent. in the last decade.

Congressional Representatives (57th Congress).—In the House: Stephen M. Sparkman, from Tampa, and Robert W. Davis, from Palatka, both Democrats. In the Senate: Stephen R. Mallory (until 1903), from Pensacola, and James P. Taliaferro (until 1905), from Jacksonville, both Democrats.

State Officers.—Governor, William S. Jennings, Democrat, elected for four years, term expires in January, 1905; secretary of state, John L. Crawford; controller, A. C. Croom; treasurer, James B. Whitfield; attorney-general, William B. Lamar; commissioner of agriculture, B. E. McLin; commissioner of education, William M. Sheats; chief justice of the Supreme Court, R. F. Taylor, term six years, expires in January, 1905; associate justices, M. H. Mabry and F. B. Carter—all Democrats.

FLUORSPAR. The production of fluorspar in the United States in 1900 is given as 18,450 short tons, valued at \$94,500, as against 15,900 short tons, valued at \$96,650 in 1899. The decrease in value is due to much of the material being marketed in the crude condition. Over 80 per cent. of the 1900 production came from Caldwell, Crittenden, and Livingston counties in Kentucky, these localities being first reported as producers in 1896. The remaining 20 per cent. came from the old locality of Rosiclare, Ill. Fluorspar is used in the manufacture of hydrofluoric acid and also in iron smelting to a limited extent, though its higher first cost prevents it from competing seriously with limestone for this purpose. It is also used in the manufacture of opalescent glass.

FLYING MACHINES. See AERIAL NAVIGATION.

FOOD. Late in 1901, a government blue-book was published in England, containing reports of testimony taken between July, 1899, and May, 1900, by a departmental committee. Seventy-eight persons, comprising physicians, chemists, pharmacists, factors, and purveyors, were examined before the committee, and the use of preservatives and coloring matters in foods and beverages was investigated. Dairy companies testified that it was necessary to use coloring matter in milk much of the year, to avoid complaints from consumers that the milk was pale and therefore not pure. It was ascertained that borax and boric acid were used (usually mixed and termed "boron") in preserving meats, butter, and milk. Salicylic acid was found in common use as a preservative for jams, jellies, and similar foods. A mixture of boric acid and borax is used, in the proportion of 8 ounces to the hundred pounds, as a partial substitute for salt in butter. Opinions differed diametrically as to the healthfulness of this customary adulterant. The committee concluded that the use of formaldehyde or of formalin or its preparations in foods or drinks should be absolutely prohibited; that salicylic acid in greater proportion than 1 grain per pint in fluids and 1 grain per pound in solids be prohibited; that the presence of salicylic acid be declared; that the use of any preservative or coloring matter in milk be constituted a punishable offense; that boric acid mixtures alone be allowed in cream, in the proportion of 0.25 per cent. or less, the amount of such preservative to be noted on the label upon the container; that boric acid mixtures alone be allowed in butter or margarine, in proportions not exceeding 0.5 per cent.; that all infant or invalid foods be free from all preservatives; and that the employment of copper salts in greening preserved foods be prohibited.

FOOTBALL. The opening of the American football season of 1901 was marked by the absence of any notable change in the rules governing the eastern colleges' play, and by the general adoption in the West of the Chicago conference rules. In neither section is it so important to amend the existing rules as it is to insure a liberal interpretation of them, and their enforcement at all times. An unwritten law has grown up, that, after all, the umpire is the best judge of when and where a rule shall operate.

Harvard had the heaviest team, well instructed and carefully drilled. It defeated Wesleyan, 16—0; West Point, 6—0; the Indians, 29—0; Brown, 48—0; Pennsylvania, 33—6; Dartmouth, 27—12, and Yale, 22—0.

Yale's tackles and backs were lighter than in 1900, and failed thereby successfully to carry out the tactics so successful then. Nevertheless, her only serious competitor was Harvard. She defeated Bowdoin, 45—0; Pennsylvania State, 22—0; Columbia, 10—5; Princeton, 12—0; tied with West Point, 5—5, and was beaten by Harvard, 0—22.

Princeton's consisted chiefly of new men, not quite up to the university's old form, yet it defeated Brown, 35—0; Lafayette, 6—0; Cornell, 8—6; tied West Point, 6—6, and was beaten by Yale, 0—10.

West Point had the best record in its history, winning from Williams, 15—0; Pennsylvania, 24—0, and Annapolis, 11—5; tied Yale, 5—5, and Princeton, 6—6, and was beaten by Harvard, 0—6.

Cornell had an exceptionally good team in 1901. She won from the Indians,

17-0; from Oberlin, 20-0; from Columbia, 24-0; from Pennsylvania, 24-6; and was beaten by Princeton only by 6-8.

Annapolis, whose team play was excellent, defeated Lehigh, 18-0; University of Pennsylvania, 6-5; the Indians, 16-5; Washington and Jefferson, 17-11; and was beaten only by Pennsylvania State, 6-11, and West Point, 5-11.

Columbia beat University of Pennsylvania, 11-0; Haverford, 29-6, and the Indians, 40-12; but fell before Yale, 5-10; Syracuse, 5-11, and Cornell, 0-24.

Lafayette's team was a strong, heavy eleven, which gave even Princeton a bad quarter of an hour. *Pennsylvania* has not been so unsuccessful since 1890. *Dartmouth's* material was good, and in the match with Harvard proved itself well coached. *Williams* had her best team in years. *Syracuse* was the only successful lightweight team of the year. It won against Columbia, 11-5; Brown, 20-0; and held Lafayette to 0-5. *Wesleyan* made a good finish, after a poor start; and *Amherst* reversed this by starting better than she ended.

Among the southern teams, Tennessee, Gallaudet, Georgetown, St. Johns, Virginia, North Carolina, and Sewanee were in the front rank.

The West had made great strides in play over previous years, Michigan certainly ranking next to Yale, and Wisconsin a close follower, while Minnesota, Northwestern, Illinois, Chicago, and Iowa were all equal to Columbia's eastern form. *Michigan* scored in her various matches 501 points to 0. Among those that went down before her were Northwestern, 29-0; Chicago, 22-0; Beloit, 89-0; Iowa, 50-0. *Wisconsin* won from Nebraska, 18-0; Chicago, 35-0; Minnesota, 18-0. *Northwestern* beat Chicago, 6-5, and Illinois, 17-1.

FORD, EDWARD ONSLOW, English sculptor, died in London, December 23, 1901. He was born in London, in 1850, and was educated in art at Antwerp and at Munich. In 1872 he first exhibited at the Royal Academy, and from that time forward was a popular and successful artist. In 1883 he executed a statue of Sir Henry Irving, which attracted a great deal of attention, and which was placed in the Guildhall Art Gallery. A statue of Mr. Gladstone was made by him in the same year for the City Liberal Club, and following this came figures of Professor Huxley, Dr. Dale, the Duke of Norfolk, and the imposing statue of Queen Victoria for the city of Manchester. The Shelley memorial at Oxford and the Strathnairn monument in London are among his other well-known works. The Ruskin medallion, ordered for Westminster Abbey in 1901, was his latest production. Mr. Ford's work was a blend of the decorative and the realistic, and much of it possessed a genuine poetic charm.

FOREIGN MISSIONS, AMERICAN BOARD OF COMMISSIONERS FOR. See AMERICAN BOARD OF COMMISSIONERS FOR FOREIGN MISSIONS.

FORESTRY. The year 1901 was a notable one in the history of forestry in the United States. The acts of State legislatures and the reports of State and national officers show a rapidly increasing interest in the subject, and evidence is everywhere present that the people of the country are awakening to an appreciation of the true value of our forests. Increasing numbers of private individuals and lumbering corporations are applying to the Bureau of Forestry of the United States Department of Agriculture for assistance in the national management of their timbered lands. Not only are cabinet officials giving heed to the importance of scientific forestry, but the President advises Congress that "the preservation of our forests is an imperative business necessity." A number of carefully prepared papers by recognized authorities have appeared in different countries in which the prophecy is made of a failure at no distant date of the world's timber supply unless radical measures are taken to conserve and exploit properly what now remains. These alarms have been repeated in many languages, and it is generally believed that the consumption of timber is progressing at a much greater rate than normal production. The ability of the United States to continue its great exports much longer is doubted, and the reserve stock of Canada, the north of Europe, and Siberia is all that is left. The estimate of the geographer of the United States Geological Survey, that 37 per cent. of the United States is forest area, has been challenged on many sides. One statistician, who has carefully considered the subject, believes the productive forest area is only about 570,000 square miles, or a little more than half the estimate given by the Survey report. From this estimate, instead of a supply equal to all demands for half a century, by which time much timber would be grown, the visible supply will last but twenty-five or thirty years. It is claimed that the Geological Survey in making its estimate has included as forest area mountains that support only a stunted growth as well as areas that have been lumbered of their valuable timber and then grown up with jack pine, alder, etc., as is the case in parts of Michigan, Wisconsin, New Jersey, etc. The superintendent of forest ranges of Quebec in his recent report estimates the spruce forests of that Province at 144,303,000 acres, with an annual consumption of 803,750 acres. At this rate, if there is no increase in consumption, the present supply will last for about 170 years. When the rapid

reproduction of spruce is considered, the supply is thought to be practically inexhaustible.

Timber Cutting.—The amount of lumber and timber produced by the mills of the country cannot be estimated with more than reasonable accuracy, as there are still companies which decline to furnish data regarding their output. From the *American Lumberman*, which has compiled very extensive tables, the following data are taken. During 1901, Michigan, Minnesota, and Wisconsin, which are believed to have furnished 25 per cent. of the timber cut during the year, produced of pine 5,428,000,000 feet board measure; hemlock, 1,200,000,000 feet; and hardwoods, 1,250,000,000 feet, making a total output for the mills of the three States of 7,828,000,000 feet. If the estimate on the 25 per cent. basis is correct, the total output of the United States would be 31,312,000,000 feet. The cut of southern pine, as returned by 160 mills operating during 1901, was 1,992,602,851 feet, an increase of 11 per cent. over the previous year. For the first time reasonably complete statistics have been obtained for the Pacific States. The stock on hand and output of the mills of Washington, Oregon, and California, reported for 1901, was 2,480,571,000 feet of fir, cedar, spruce, redwood, pine, and hardwoods. Adding the estimated capacity of known mills which did not send returns, the total for the Pacific Coast may be placed at three billion feet. The returns available from the census of 1900 show an increase of 192 per cent. in the capital and 152 per cent. in the value of the output of turpentine, resin, and other naval stores and their products over the previous census.

The Department of Agriculture.—One of the most important events in the history of scientific forestry in the United States was the reorganization of the Division of Forestry into the Bureau of Forestry with considerably enlarged scope, working force, and resources. The bureau, as now constituted, consists of three divisions: forest management, forest investigations, and records. Each of these divisions continues in an enlarged way the work which was in progress under the former organization. The division of forest management prepares working plans for wooded areas under terms of cooperation between the owners and the division. For tracts of less than 200 acres the owner is at no expense whatever. For larger tracts, all expenses, except salaries of the regular employees of the bureau, are paid by the owner, and in return he is given expert advice on the management of his wooded areas. The division of forest investigations makes studies on the growth, distribution, and habits of trees, forest problems in connection with fires, grazing, tree planting, stream flow, and erosion. The division of records has charge of the ordinary routine of the offices, charge of the library, and the preparation of the large and rapidly growing collection of photographs of forest scenes and objects. To this collection more than 6,000 were added during 1901. The Bureau of Forestry is now called upon to give advice and assistance in the management of nearly 50,000,000 acres of national, state, and private forests. During 1901, 38 applications were made by private owners for assistance in the management of 288,555 acres of forest. Detailed working plans were prepared for four private tracts as follows: 100,000 acres of short-leaf and loblolly pine in Arkansas, belonging to the Sawyer and Austin Lumber Company; 52,000 acres of hardwood forest, belonging to the Deering Harvester Company in Missouri; 1,600 acres of second growth hardwood forest, belonging to Hon. W. C. Whitney in Massachusetts; and 60,000 acres of spruce land in the Adirondack range, belonging to W. G. Rockefeller. Work has been begun on working plans for other tracts which embrace 628,000 acres in Maine, New York, Tennessee, and other States. There are now four tracts in the Adirondacks to which scientific forestry is applied, under the supervision of the bureau. These areas embrace 156,470 acres, more than 10,000 of which were added during 1901.

As rapidly as possible the Bureau of Forestry is preparing plans for the management of the national forest reserves. The field work necessary to working plans for the Black Hills reserve has been completed, and examinations begun of the Prescott, Big Horn, and Priest River reserves. The division of forest investigations began or has continued studies of the redwood, red fir, western hemlock, western yellow pine, big tree groves, long leaf pine, balsam, white ash, hickory, and several species of oak. Monographic studies of the red cedar, white cedar, and bald cypress have been completed, and that on the red cedar by Dr. Charles Mohr was published as Bulletin 32 of the Division of Forestry. Dr. Mohr, who died July 17, 1901, left completed studies of eleven of the more important oaks. In cooperation with the United States Geological Survey, an examination was made under authority from Congress of the region of the proposed Appalachian Forest Reserve. The area of the proposed reserve embraces about 9,600,000 acres in the lower part of the Appalachian mountain system. The investigation was made by the specific authorization of Congress, and a report will be presented on its suitability as a forest reserve and the probable benefit accruing from its careful and conservative management. In anticipation of this report there have already been introduced in Congress

a number of bills to establish the reserve. The study of the effect of grazing and fires was continued in twelve of the national forest reserves during 1901. Applications were received from 148 individuals for assistance in forest planting and examinations were made of 46,145 acres and detailed plans prepared for 5,785 acres, the most of which is to be planted in small tracts. Several applications have been made for planting plans for tracts of 5,000 acres or more. In the tree-planting investigations the bureau furnishes the plans and advice, the owner paying for all materials and labor. Studies were begun in Nebraska to determine the possibility of reclaiming portions of non-agricultural lands on the Great Plains by judicious planting and by protection from fire and grazing. These regions were hitherto believed to be beyond the limits of tree growth, yet the studies so far conducted show the practicability of silviculture over large areas of that country. The studies of the forests of Texas have been completed and an elaborate report upon them will soon be published. The appropriations for the Bureau of Forestry for the fiscal year ending June 30, 1902, are \$187,240, and for the previous year they were \$88,520, an increase of more than 110 per cent.

The Department of the Interior.—The work of this department relating to forestry is readily divided into the administrative work under the commissioner of the Land Office and the surveying, mapping, and describing of the reserves by the Geological Survey. Since the close of the fiscal year ending June 30, 1900, three new forest reserves have been created by presidential proclamation: the Crow Creek Forest Reserve in Wyoming, October 10, 1900; Wichita Forest Reserve in Oklahoma, July 4, 1901; and the Payson Forest Reserve in Utah, August 3, 1901. By executive order 46,080 acres were eliminated from the Cascade Forest Reserve in Oregon and 142,080 added to it, making a net increase in the size of the reserve of 96,000 acres. Other forest reserves were reduced in size by executive orders during 1901, as follows: Washington Forest Reserve in Washington, Big Horn Reserve in Wyoming, and the Olympic Reserve in Washington. There are now 41 national forest reserves, embracing over 46,000,000 acres. Temporary withdrawals have been made of various portions of the public domain pending the consideration of the advisability of making them permanent, as follows: Proposed Elkhorn reserve in Montana, Salt Lake reserve in Utah, Las Animas reserve in Colorado, Tooele reserve in Utah, and Elk Creek reserve in Oregon.

In order to care better for the forests and to adjudicate more promptly matters appertaining to them, a partial reorganization has been effected by the secretary of the interior, of the forestry division of the General Land Office. Mr. Filibert Roth, formerly of the Division of Forestry of the Department of Agriculture and later of the Cornell School of Forestry, has been placed in charge of the division. It is hoped by a better supervision of the forest inspectors and rangers that there will be less loss from fires and the stealing of timber. The sale of mature timber from the reserves is to be encouraged, and after January 1, 1902, timber killed by fire will be sold at the same rate as green timber. In this way it is believed possible to prevent intentional starting of forest fires to secure dead and down timber at reduced prices. Field operations on the part of inspectors, rangers, and others is to be made of prime importance and administration through reports from reserves is to be secondary. The police patrol is to be made as efficient as possible to prevent fires and stealing. Forest fires in Washington, Oregon, Colorado, etc., were unusually destructive during 1901. Depredations on public timber during the year were reported in 548 cases, amounting to \$1,464,000, and action was begun to collect damages and punish the criminals. In his report to the President the secretary of the interior recommends, that if it is found practicable, the administration of the forest reserves be turned over to the Department of Agriculture, the Bureau of Forestry of which is already equipped with an efficient corps of trained foresters. The forestry work of the Geological Survey has been along lines similar to those pursued for a number of years. The investigation of the forest reserves has been continued and their condition is now better understood. The investigation and mapping of the proposed new reserves has occupied considerable time, but the details cannot be presented, as the report has not yet been issued.

Forestry in the Philippines.—During the Spanish régime a sort of state control was exercised over the forest domain of the islands. After American authority was assumed the forestry bureau was reorganized and placed upon a permanent basis. This bureau is now attached to the Department of the Interior of the insular government, and is provided with a chief, assistant chief, inspectors, foresters, rangers, etc., to the number of about eighty. A license is now required to cut timber on public lands, and a fixed price per cubic foot of timber cut is demanded. The timber of the islands has been classified into six groups, and for the privilege of cutting the lumberman is required to pay 1, 2, 3, 8, 10, and 14 cents per cubic foot, dependent upon which group is cut. Only timbers of the three cheapest kinds may be cut for fuel. The public domain of forest is estimated at between 20,000,000

and 40,000,000 acres; but while the islands are densely wooded, no extensive tracts of pure forest of single species are known, and lumbering for a particular kind will be expensive and difficult. The revenue received during the first year of American management netted a decided increase over that previously reported, and it has been estimated that under scientific management a revenue of \$1,000,000 may be annually secured. The white ants or termites are a source of much timber destruction in the islands, and on account of them care must be exercised in selecting structural timbers. An experiment conducted for a short time only seemed to indicate that white cedar, hemlock, and redwood from the Pacific Coast States were nearly or entirely exempt from their attacks. A report on *Some Important Timber Trees of the Philippines* has been recently issued by Capt. G. P. Ahern, chief of the insular Bureau of Forestry. See PHILIPPINES (paragraph Forests and Timber Products).

State Forestry.—Important advance has been made in a number of States along lines of forestry. Pennsylvania has established a Department of Forestry, with Dr. J. T. Rothrock as commissioner. The department is given authority to acquire lands for timber reserves and is given control of all such State property, which now amounts to 324,000 acres, of which 30,000 acres are in an almost solid body and protect the headwaters of a number of streams which empty into the Delaware River. In Connecticut the legislature has provided the beginning of forest improvement and extension. In connection with the Board of Control of the State Experiment Station, a forester has been appointed and an appropriation was made to begin experiments in the reforestation of barren lands with oak, pine, and chestnut, the lands to become State parks. The legislature of Indiana has authorized the appointment of a State Board of Forestry and has reduced to a nominal sum the taxes upon lands devoted exclusively to forest purposes. Michigan has placed 100,000 acres of public domain to the use of its Forest Commission. In Minnesota non-agricultural lands reverting to the State through delinquent taxes are set aside as forest reserves. California has appropriated \$260,000 to purchase a redwood reserve in the Santa Cruz mountains as a State park. The legislatures of all of the States in which parts of the proposed Appalachian Forest Reserve are located have passed laws exempting such lands from taxation and have permitted the passing of title of all lands acquired for the purposes of the park. The town of Brunswick, Me., has the distinction of being the first municipality in the United States to engage actively in forest planting. A tract of 100 acres belonging to the town will be planted to white pine. The land is now wholly unproductive, but it is hoped that it will become revenue producing, as is the case of many municipal forests in Europe. A majority of the States have laws which relate to forest fires. In several these have been amended recently to make them more effective, but the difficulty of enforcement annuls most of them.

Forest Associations, Schools, etc.—The summer meeting of the American Forestry Association was held at Denver, Col., August 27-29, 1901, with a large attendance. Numerous papers of interest were presented and illustrated lectures were delivered by Mr. Gifford Pinchot on *The Government and the Forest Preserves*, and by Mr. F. H. Newell on *Forests and Irrigation*. The twentieth annual meeting of the association was held at Washington, D. C., on December 11, 1901, Hon. James Wilson, secretary of agriculture, was reelected president. An international Society of Arboriculture was organized at Connersville, Ind., in June, with delegates from thirty-seven States and many foreign countries. A forest association was organized in Tennessee in August, and it held its first general meeting at Nashville in November. A Society for the Protection of New Hampshire Forests was organized during 1901. A Park and Forest Association was organized at Des Moines, Ia., which will urge the appointment of a State Commission. The Massachusetts Forest Association held its fourth annual meeting in Boston in December. The successful efforts of the association in preventing the despoliation of the Blue Hill reservation was reported and measures looking towards the preservation of Greylock Mountain were announced. The Minnesota Forest Association met in Minneapolis in December, when a resolution was adopted pledging the organization to use its best endeavors to secure a national forest reserve in Minnesota to protect the headwaters of the Mississippi River. There are now said to be twenty-two national and State forest associations in the United States.

The Forestry Schools of the country report a successful year's work and increased attendance. At the New York State College of Forestry, which is affiliated with Cornell University, 38 students were enrolled against 17 in 1900. The Yale Forestry School reports an enrollment of 31 students and 11 students are matriculated at the Biltmore School of Forestry. The New York institution will hereafter grant its graduates the degree of Forest Engineer instead of Bachelor of the Science of Forestry. The Yale School held a very successful summer school at Milford, Pa., where courses of instruction were given those who did not wish to take the longer courses at the regular school. Agitation

has been begun for the establishment of schools of forestry in connection with the University of Minnesota and the State College of Pennsylvania. Some degree of instruction in forestry is now given at more than fifty of our agricultural colleges and other educational institutions. See LANDS, PUBLIC.

FORMALDEHYDE. See FOOD.

FORMOSA, an island belonging to Japan, in the Pacific Ocean, lies 100 miles off the coast of China, and 250 miles north of the Philippines. It has an area of 13,458 square miles, and a population, according to the census of December 31, 1898, of 2,690,096, the larger part of whom are Chinese. The seat of government is at Taipei. The island is very mountainous. The interior, inhabited by an uncivilized race of Malays, is almost inaccessible. The largest city is Tainan, other towns of importance being Tamsui and Auping. Since its acquisition by Japan in 1898 the island has been under military rule. The administration is in charge of a governor-general and magistrates for each of the six districts into which the island is divided. The Pescadores, a small group of islands off the western coast, are attached to Formosa for administrative purposes. The budget of 1901 for Formosa balanced at 22,126,483 yen (the yen is worth 49.8 cents). The Japanese government furnished a subsidy of 8,998,000 yen, and over 9,000,000 yen were received from government monopolies, of which the camphor monopoly is the most valuable. The island produces tea, coal, camphor, sugar, rice, indigo, and fruits. The total exports, exclusive of the trade with Japan, amounted in 1899 to 11,092,623 yen, and the imports to 14,273,094 yen. The export trade is largely with China (8,692,467 yen in 1899), with Hong Kong, whence transshipment is made to Europe, and with the United States. The value of the principal items of export in 1899 were: Black tea, 5,295,796 yen; camphor, in the production of which Formosa leads the world, 1,732,740 yen; rice, 1,265,727 yen, and sugar, 1,586,945 yen. There are two railway lines, one connecting Takow and Kelung and the other Tainan and Taipei.

FORSHELL, HANS LUDWIG, Swedish statesman, died at San Bernardino, Switzerland, August 2, 1901. He was born at Gräsle, Sweden, in 1843, and entered the University of Upsala in 1859, where he became in 1866 doctor of philosophy and docent of history. In 1874 he was chosen secretary of the National Bank of Sweden, and a year later was made minister of finance. Resigning from this post in 1880, in consequence of a disagreement with the Swedish premier, he became president of the board in control of the public domain. For some years preceding 1897 he was a member of the Swedish Chamber, and took an active part in the discussion of public affairs.

FOSSIL BOTANY. Text-books on this subject are much needed, and it is pleasing to record the appearance of a new one, namely, *Studies in Fossil Botany*, by D. H. Scott (London, 1900). Among the recently published papers on this subject may be mentioned the *Stratigraphical Succession of the Fossil Floras of the Pottsville Formation in the Southern Anthracite Coal-fields*, by David White, United States Geological Survey, *Twentieth Annual Report*, pt. 2, pp. 749-930; *A Study of Some American Fossil Cycads*, by G. R. Wieland, pt. iv., *American Journal of Science*, June, 1901, p. 423.

FOSTER, L. L., American educator, died at Dallas, Tex., December 2, 1901. He was born in Georgia in 1853, and went to Texas in 1867. Self-educated, he was engaged for a time in journalistic work, and later went into State politics. He served three terms in the legislature of Texas, once as speaker, and later was appointed commissioner of insurance statistics and history. In 1898 he was manager of Governor Sayer's campaign, and in the same year was made president of the Texas Agricultural and Mechanical College.

FOUNTAINS, ELECTRIC. See ELECTRIC LIGHT AND POWER.

FOUQUIER, JACQUES FRANÇOIS HENRI, French journalist, died in Paris, December 25, 1901. He was born at Marseilles, September 1, 1838, and studied both law and medicine, without however taking a degree in either. In 1861, after some years of travel in Spain and Italy and a course of study in Italian art, he went to Paris, where he engaged in journalism. As special correspondent he was with Garibaldi in the campaign of 1867, and in 1870 he was sent on a government mission to Marseilles, where he founded, with M. Labadie, *La Vraie République*. After holding the posts of secretary of the department and prefect, he returned to Paris and was appointed press censor in the interior department. In 1885 he was first elected to the Chamber of Deputies, and was reelected in 1889. He published a number of volumes on art and literature, including: *Etudes Artistiques* (1859); *l'Art Officiel et la Liberté* (1861); *Au Siècle Dernier* (1884); *La Sagesse Parisienne* (1885); and, with M. Ranc, a five-act drama, *Le Roman d'une Conspiration* (1890).

FRANCE, a republic of western Europe lying between the Atlantic Ocean on the west and Germany on the east. The capital is Paris.

Area and Population.—The area, including Corsica (3,377 square miles), is placed at 204,092 square miles. The census returns for 1901, published in June, show the population to be 38,641,333, an increase since 1896 of only 123,358. The increase of Paris and its suburbs slightly exceeds this small increase, so that the population of the rest of France actually declined. And the greater part of the increase in Paris was due to foreign immigration. The population of the principal cities has undergone the following changes: Paris has increased from 2,536,824 in 1896 to 2,660,559 in 1901; Marseilles from 442,239 to 494,769; Lyons from 446,428 to 453,145; Bordeaux from 256,906 to 257,471; Lille has declined from 216,976 to 215,431, and Toulouse from 149,963 to 147,696. Since 1850 the population of France, allowing for alterations of boundaries, has increased only from 35,000,000 to 38,641,000, whereas that of Great Britain has risen from 27,000,000 to 41,000,000; Germany, from 35,000,000 to 56,000,000; Austria-Hungary, from 30,000,000 to 45,000,000; Italy from 23,000,000 to 32,000,000, and Russia (partly owing to annexations), from 66,000,000 to 128,000,000. France has been long preoccupied with the question of depopulation, which, it seems to be admitted, is largely caused by social conditions. One of these conditions is the disinclination to marriage, and another and more potent one is the reduction in the size of the families. "Families having only one child, or at the most two children, are becoming in the country as in the towns an almost universal rule." No one wants to marry a girl unless she has a dot or dowry and is able after marriage to meet her own expenses. A father seems to think it necessary to provide for all his children; that is, to lay up a sum to support his daughter during life, and also, if possible, for his son. In the country there is an endless subdivision of land, a father parceling and reparceling his own small patrimony so as to make room for his children on the same plot. In other words, there is too much frugality and altogether too little initiative and independence.

Frenchmen are probably most concerned with the comparison between the population of France and that of Germany, since, in days of universal conscription, the balance of numbers on either side of a land frontier becomes of immense importance. The German census of 1900 gave a population exceeding 56,000,000, a number practically half as large again as that of France. France stands alone among the great nations of Europe in slowness of numerical increase. In contradistinction to the general apprehension with which the "depopulation" of France is regarded by most serious men, a view has been advanced in some quarters that has the merit of novelty, if not of perfect soundness, and contains, too, a good deal of truth. This looks upon the failure of the French people to increase more in the nature of a good than a calamity, and points out that a teeming population is not an unredeemed blessing, if with it comes want, lack of employment, and overcrowding, as is the case with Great Britain and Italy; as one Frenchman wittily remarked, "Germany has doubled its population within the last 50 years and is now in the throes of a famine." Certain it is that France in a great measure has been spared such industrial crises as have visited all the other European countries at various times during the last decade.

Religion and Instruction.—No religious census is taken in France. The government contributes to the maintenance of all forms of public worship having a considerable number of adherents. In 1901 the government contribution, divided in proportion to numerical strength, was 41,158,923 francs to Roman Catholics, 1,495,100 to Protestants, and 206,530 to Jews. Primary and secondary education is partly in the hands of the state and partly under the control of various Catholic organizations. For the relation of the question of public instruction to the Catholic congregations, see paragraph Associations Bill, under History. In 1899 the public schools were attended by 4,159,576 children, of whom 3,814,676 attended the lay schools and 354,902 the clerical schools. The number of children enrolled in private schools during the same year was 1,369,721, of whom more than 90 per cent. attended Catholic schools. Secondary education is provided for by state institutions known as lycées and by communal colleges, to the latter of which the state also contributes in part. In 1899 the number of lycées for boys was 110, with an attendance of 51,997, and the number of communal colleges was 229, with an enrollment of 32,510. In private institutions at the same time, secondary instruction was imparted to 79,007 boys, of whom more than 85 per cent. attended the ecclesiastical schools. In 1899 the number of girls enrolled in the various secondary institutions was 16,233. The universities of France afford instruction in letters, theology, science, law, medicine, and pharmacy. In 1901 the number of students in the state universities was 29,901. The enrollment in the principal universities was: Paris, 12,289 (the largest in the world); Lyons, 2,458; Bordeaux, 2,119, and Toulouse, 2,040.

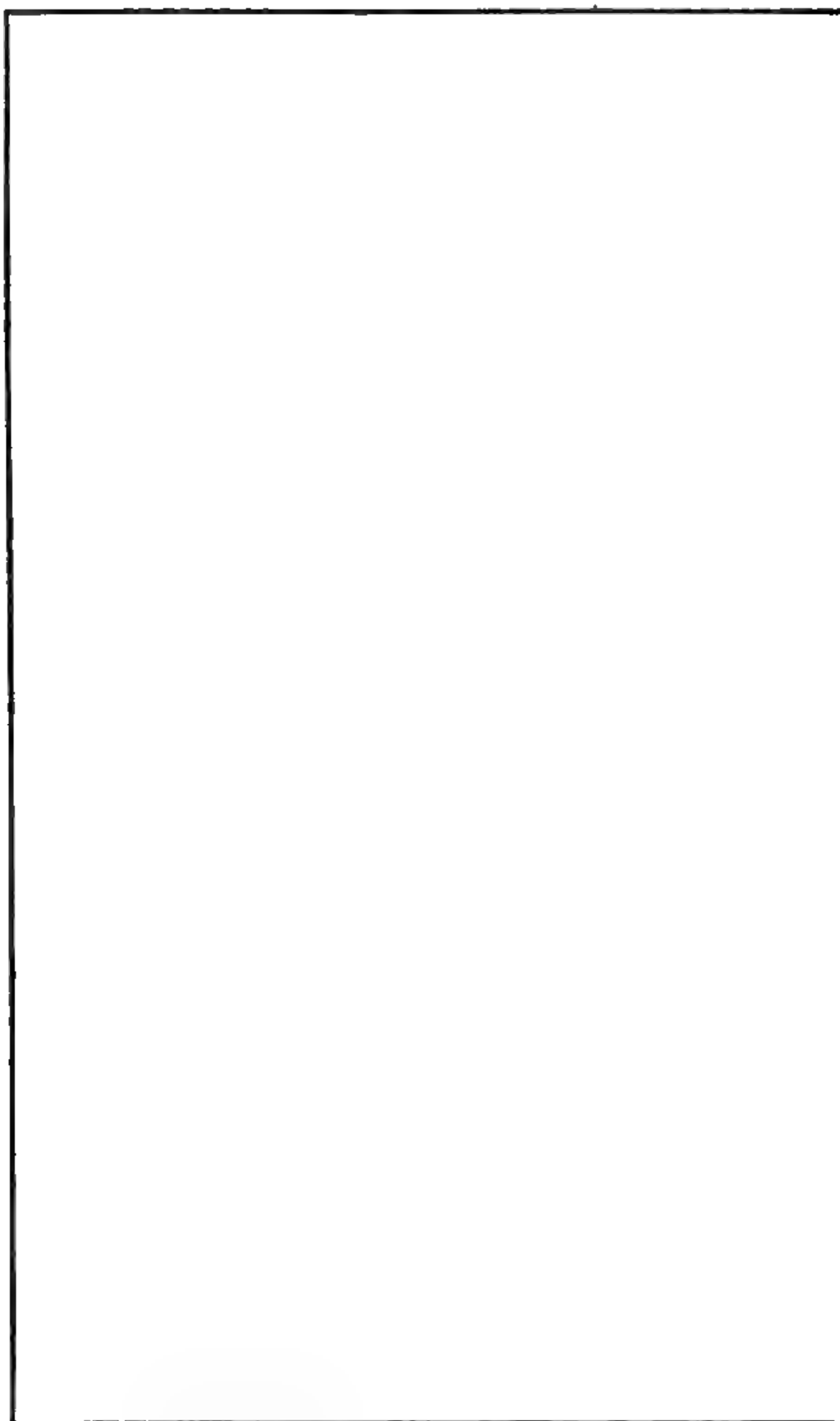
Government.—France has been under a republican form of government since the fall of Napoleon III. (September 4, 1870). The present constitution was adopted in 1875 and has been repeatedly amended since that time. The legislative power is vested in a Senate and a Chamber of Deputies, and the executive authority is exercised by a president. The Chamber of Deputies is composed of 584 members, elected

by universal suffrage for a period of four years: The various departments of France are divided for electoral purposes into *arrondissements*, of which each chooses one deputy. The senators, who hold office for nine years, are 300 in number and are elected by the general municipal and district councils of each department, together with the deputies and senators from that department. One-third of the Senate is retired every three years. There are at present 16 life senators, selected by the National Assembly of 1875. The two houses in joint session elect the president of the republic. He holds office for seven years and is aided in the performance of his duties by a council of ministers responsible to the lower Chamber. For purposes of local administration the country is divided into 87 departments, governed by prefects. The unit of municipal government is the commune. The president in power during 1901 was M. Emile Loubet, elected February 18, 1899. The premier and minister of the interior was M. Waldeck-Rousseau. Other leading members of the cabinet were M. Delcassé, the foreign minister, and M. Millerand, minister of commerce, industry, posts, and telegraphs. The legal system is based on the Code Napoléon. The courts of first instance are the justices of the peace and police magistrates for the trial of petty offenses, and correctional tribunals for more serious cases of misdemeanor. There are courts of assizes, with a jury, for the trial of criminal offenses. Tribunals of second instance are the 26 courts of appeal for the review of criminal trials, conducted without a jury. The Court of Cassation is the court of last resort. Its jurisdiction, however, is limited only to questions of law. It also listens to appeals from the jury courts of assize.

Army.—The French army, which is based on conscription, is the third in size among the European nations, that of Russia ranking first and Germany second. Every male citizen between the ages of 20 and 45 is liable to military duty, the terms of service being 3 years in the active army, 10 years in the reserve, 6 years in the territorial army, and 6 years in the territorial reserve. The land forces are subdivided into 20 *corps d'armée*, each of which is a complete organization with respect to the different arms of the service—infantry, cavalry, artillery, engineers, and train. In addition to the regular forces, the troops of the military department of Paris and the *gendarmérie* are liable to service in time of war. In 1901 the peace strength of the army was 27,044 officers and 494,469 men in France, and 2,946 officers and 74,806 men in Algeria and Tunis.

Navy.—The French navy ranks next after that of Great Britain, for simultaneously with the development of her colonial policy France has fostered the growth of her fleet. On February 1, 1901, the strength of the French fleet was as follows: Battleships of the first class, 5, with 3 building, and 3 projected; battleships of the second class, 7; and battleships of the third class, 13. The number of armored cruisers was 13, with 6 building and 5 projected, and the number of protected cruisers was 40. There were also 15 torpedo gunboats, 11 destroyers, with 4 building and 8 projected; and 176 torpedo boats of different classes. On the same date there were 10 submarine boats in commission, 4 building and 10 planned. As may be seen, the French navy is especially strong in torpedo boats, upon which great reliance is placed in the matter of coast defense. France also takes the lead in the construction of submarine craft, based upon different models. So far they have proved quite satisfactory. On October 26, 1901, the *Léon Gambetta*, a first-class battleship of 12,500 tons, was launched at Brest. Early in the year orders were placed for the *Victor Hugo*, a sister ship to the *Gambetta*. Twenty-eight destroyers and 11 first-class torpedo boats were planned for the immediate future. In 1898 the naval establishment numbered 1,733 officers and 40,589 men.

Finance.—The revenue is derived from direct taxation (lands, buildings, furniture, doors, windows, and patents) and indirect taxation (customs, monopolies, and state enterprises). In 1899 the revenue amounted to 3,496,863,520 francs. In 1900, according to the budget officially adopted, the revenue was 3,547,932,981 francs. For 1901 the estimates were 3,551,570,497 francs. The chief items of expenditure are the public debt, war, navy, instruction and fine art, public works, posts and telegraphs, and colonies. The preliminary budget for 1902 showed an increased expenditure of 43,000,000 francs, which is only partially counterbalanced by an increase of 35,000,000 francs in the revenue. In 1901 the receipts from customs showed an unexpected decline, and during the first nine months of the year the income fell 80,000,000 francs below the estimate. The most important attempt at financial legislation of 1901 was a bill passed by the Chamber on February 22, greatly increasing the scale of duties in the inheritance tax. The bill, though rejected by the Senate, is interesting as illustrating the growing tendency in France to impose heavy burdens upon capital. The proposed measure provided for an increase of one-twelfth in the tax on all legacies above one million francs. Between five and ten millions the increase was by one-eighth; between ten and twenty millions, by one-half; between twenty and one hundred millions, double the existing tax, and over one hundred millions, three times. The full severity of the measure will be appreciated if the existing scale of taxation be considered. At present the law imposes a tax of 1 per cent.



FRENCH STATESMEN —President Loubet (upper left corner), Delcassé (upper right),
Waldeck-Rousseau (lower left), Deschanel (lower right).

on all legacies in the direct line above 2,000 francs; $1\frac{1}{2}$ per cent. on amounts from 10,000 to 50,000; 2 per cent. from 100,000 to 250,000; and $2\frac{1}{2}$ per cent. above that sum. Upon legacies from husband to wife the duty ranges from $3\frac{1}{2}$ to 7 per cent.; from brother to sister, $8\frac{3}{4}$ to 12 per cent.; from uncle or aunt to nephew, 10 to $13\frac{1}{2}$ per cent.; and between strangers in blood from 15 to $18\frac{1}{2}$ per cent. Under the new measure in some extreme cases the tax would have risen as high as 64 per cent., which, as remarked in France at the time, practically amounted to confiscation. There was also considerable discussion during the year of increasing the income tax, partly to meet the exigencies of the growing budget and partly to make up for the loss from certain direct contributions which it was proposed to abolish.

Agriculture.—The principal cereal crops, in the order of their importance, are wheat, oats, barley, rye, buckwheat, and maize. The mulberry is extensively cultivated, and beets, olives, and cider apples are raised to a very considerable amount. In the production of wine France leads the world. In 1899 more than 91,000,000 acres, or about 70 per cent. of the total area of France, was under crops and grass. In that year the yield of the various cereals in hectolitres (one hectolitre equals 2.838 bushels) was: Wheat, 128,418,920; oats, 95,301,320; barley, 15,965,790; rye, 23,577,000; buckwheat, 8,106,430; maize, 9,002,990. The production of wine amounted to 46,810,000 hectolitres (one hectolitre equals 26.417 gallons), and the production of silk cocoons to 6,993,339 kilogrammes (one kilogramme equals 2.2046 pounds). A closely approximated estimate placed the wheat crop of 1900 at 128,217,000 hectolitres, and the rye crop at 23,676,000 hectolitres. The production of wine in the same year was extraordinarily large, amounting to 67,352,661 hectolitres—an increase of nearly 21,000,000 hectolitres over the preceding year, and of more than 31,000,000 hectolitres over the average annual production for the last ten years. The yield has been exceeded only three times during the last one hundred years. That this enormous increase was due almost entirely to favorable conditions of sun and weather, and only in a very small degree to an increase in the extent of area under cultivation, is shown by the fact that the average yield per hectare was 39 hectolitres as against 28 hectolitres in 1899. For 1901 partial figures pointed to a return to normal production, though still showing a very full yield, amounting probably to 55,000,000 hectolitres. The prospects of the wheat crop for 1901 were exceptionally discouraging. At the highest estimate the yield was placed at 108,000,000 hectolitres, a decline of 15 per cent. from 1900, and it was thought not improbable that it might fall as low as 90,000,000 hectolitres, necessitating the importation of 35,000,000 hectolitres from abroad. An interesting feature of agricultural development in France is the high degree to which the organization of both farm laborers and employers into unions has been carried. These unions, or "syndicates," are corporations established by law, and authorized to own such property as is necessary for their meetings, libraries, and lecture rooms. They may establish banks for the safekeeping of pension funds, and tribunals for the settlement of disputes among the workingmen or between the employers and wage-earners. The number of these syndicates in 1900 was 7,089, with a membership of 1,192,260; of these, 2,157 were syndicates of large landowners, 2,685 of workingmen, 170 of employers and workingmen mixed, and 2,607 of small farmers, the latter aggregating 572,794. The syndicates are combined into territorial unions, of which there are ten in France. The advantages arising from such unions, as pointed out by the United States consul at Lyons, are twofold: materially they make possible "the buying of fertilizers and implements at wholesale prices; the securing of cheap transportation; the sale of products in the best markets" and at the most advantageous times. Politically the farmers' syndicates, though free from all partisan spirit, are able to influence in large measure all legislation affecting the interests of the agricultural classes. Probably more important than either of these advantages is the fact that the unions have served to bring employers and wage-earners into harmonious relations. "In the union of the southeast," with headquarters at Lyons, "out of 61,282 members, 7,808 are capitalists—men who can, if they please, live on their incomes—while the 53,474 are employees or small farmers. The poorer classes seek the advice and cooperation of capitalists, bankers, and any other successful business men."

Minerals.—The two principal minerals produced in France are coal and iron, though silver, lead, zinc, manganese, and antimony are also found. In 1899 the output of coal and lignite was 32,933,780 tons; pig iron, 2,567,388 tons; wrought iron, 842,755 tons; steel, 1,259,701 tons. In 1900 the production of coal was placed at 33,270,385 tons; pig iron, 2,699,494 tons; wrought iron, 745,312 tons; and steel, 1,264,737 tons. The annual consumption of coal is about 42,000,000 tons, necessitating the importation of some 10,000,000 tons from England, and to a smaller extent from the United States. In 1899 there were 11,658,919 tons imported; in 1900 the amount rose to 14,335,740 tons. In 1897 the number of men employed in the mines was 156,504.

Commerce and Manufactures.—Under the head of general commerce is included the total volume of exports and imports; under the head of special commerce all commodities of export produced in the country and all imports consumed there. The principal articles of export are woollen, silk, and cotton tissues, wine, manufactured articles, robes, confectionery, and artificial flowers. The chief commodities imported are raw wool, cotton and silk, foodstuff, machinery, metal, oils, and timber. In 1899 the special exports were valued at 3,899,142,000 francs and the imports at 4,217,000,000 francs. In 1900 the special exports amounted to 4,078,032,000 francs and the special imports 4,408,530,000. Of the imports the value of the foodstuffs amounted to 828,921,000 francs; manufactured articles, 841,430,000 francs; and raw materials, 2,738,179,000 francs. The exports were divided as follows: Foodstuffs, 776,378,000 francs; manufactured articles, 1,995,862,000 francs; raw materials, 1,090,375,000 francs. It will be seen that in the matter of foodstuffs the exports and imports nearly balance, with a slight excess in favor of the latter; generally the difference between the two is more marked, as in the matter of cereals the country is not self-supporting, but the tendency has lately been towards a decrease in the excess of imports over exports. In the case of raw materials and manufactured articles it is evident that in the matter of exports and imports they are related to each other in inverse ratio. In 1900, that is, the raw material exported amounted to 40 per cent. of the raw material *imported*; at the same time the manufactures *imported* were equal to a little over 42 per cent. of the manufactures exported. Evidently, then, the mass of raw material brought into the country is sent back in the form of tissues and manufactured articles. This is especially true of woollens, silk and cotton textiles, and of leather goods. The part contributed by the leading nations to the special commerce of France is approximately as follows: In imports—Great Britain, 13 per cent.; the United States, 10 per cent.; Germany, 8 per cent.; Belgium, 7 per cent.; Spain, 6 per cent.; Argentine Republic, 6 per cent.; Algeria, 6 per cent.; British India, $5\frac{1}{2}$ per cent.; Russia, 5 per cent.; Italy, 4 per cent. In exports—Great Britain, 30 per cent.; Belgium, 15 per cent.; Germany, $8\frac{1}{2}$ per cent.; Algeria, $6\frac{3}{4}$ per cent.; the United States, 9 per cent.; Switzerland, $5\frac{1}{2}$ per cent.; Italy, $4\frac{1}{2}$ per cent.; Spain, 3 per cent. In 1900 the imports from the United States were \$82,553,335 and the exports to the United States, \$72,181,212. The principal ports of the country share in the foreign trade in the following proportion: Marseilles, about one-fifth; Havre, one-sixth; Paris, 7 per cent.; Bordeaux, $6\frac{1}{2}$ per cent.; Dunkirk, 6 per cent.; Boulogne, $4\frac{1}{2}$ per cent. According to the census of 1896 there were 52,971 industrial establishments. Of these the agricultural works (mills, wine and cider presses, etc.) numbered 15,329; food establishments, 9,141; building, 6,922; textiles, 6,627; metals, 4,926. The sugar industry in 1898 employed 42,607 men, 3,577 women, and 2,427 children.

Shipping.—In the fall of 1900 the merchant marine of France, which ranks fifth after that of Great Britain, Germany, the United States, and Norway, was estimated at 1,401,000 tons, of which 1,060,000 tons were in steam bottoms and 3410,000 in sailing vessels. In 1898 the entries in French ports were 82,094 vessels of 11,907,268 tons sailing under the French flag, and 20,965 vessels of 11,950,683 tons under foreign flags; the clearances were 82,585 French ships of 12,220,972 tons and 21,291 foreign ships of 12,076,343 tons. In 1899 the number of French ships entered was 80,135, with a tonnage of 12,167,655, and the number of foreign bottoms 21,055, with a tonnage of 12,743,851. The clearances were 80,556 French vessels of 12,369,276 tons and 21,308 foreign vessels of 12,811,684 tons. By comparison with other maritime nations the merchant fleet of France has grown very little. This in great measure is due to the unwise policy of fostering the building of sailing vessels at the expense of steamers. At present the annual ship subsidy granted by the government amounts to 26,000,000 francs, and before 1909 it will rise as high as 60,000,000 francs. As a result, French ships, which between 1880 and 1890 carried 30 per cent. of the country's trade, now carry only 20 per cent. The question of a new subsidy law to supersede the act of 1893 now in force was discussed at great length during 1901, and action on the part of the chamber was repeatedly urged by M. Millerand, the minister of commerce. It was proposed radically to alter the provision of the law so as to encourage the building of steam vessels, but powerful interests were opposed to such a measure, and at the end of the year the question was still a mooted one.

Communications.—In 1899 there were 30,775 miles of roads over 40 feet wide connecting all the principal cities. There are 5,500 miles of navigable rivers and 2,970 miles of canals. The railways were built under concessions from the government, which guarantees the interest on the bonds. Ultimately they are all to come into the possession of the state, which at present owns one of the six main lines. In 1899 the length of the railway lines in operation was 23,375 miles, with gross receipts amounting to 1,475,000,000 francs and a net profit of 694,300,000 francs. In 1900 the number of miles had increased to 23,600, the receipts to 1,578,300,000

francs, and the profits to 695,100,000 francs. In 1899 there were 79,396 miles of telegraph, and in 1898 23,352 miles of telephone.

HISTORY.

The Cabinet.—On June 22, 1901, the Waldeck-Rousseau ministry completed the second year of its existence with its position seemingly more assured and its prestige at a higher point than at any time during its entire tenure of office. No other cabinet since the Franco-Prussian War has remained so long in power, or, retaining power, has succeeded in carrying out so aggressive a policy at times of acute national crisis and in the face of a militant parliamentary opposition and a hostile press. On the same day that it entered upon its third year of office, the ministry achieved the greatest triumph of its career in securing the passage through the Senate of the much discussed Associations Bill. More than any other measure fathered by the government, the law of associations emphasized the heterogeneous composition of the ministry and the radical influences to which at times it seemed entirely to yield. A rather unusual spectacle is afforded by a cabinet composed of *bourgeois* representatives and the leaders of a revolutionary party working in harmony on the basis of constant and mutual concession. These two elements, in spite of the laws of political probability and the predictions of political prophets, have obstinately failed to prove the ruin of the cabinet, and have become in fact the main sources of its strength. Anomalous, too, is the condition presented by a country like France, in which capitalism has developed to a great degree, governed by a ministry which seems to be guided by men whose principles of political economy are entirely subversive of existing things. Yet it is a fact that under the administration of Waldeck-Rousseau the country has prospered, for notwithstanding the great amount of discussion concerning the depopulation of France and the blighting of its industries by the aggressive conduct of the French workmen and paternal legislation on the part of the government, the surest test of national strength, the public credit, would seem to indicate that at present both the state and the people of France are in no financial straits. In October, 1901, a loan of 65,000,000 francs, voted to defray the costs of the Chinese expedition, was over-subscribed twenty-five times within the country. That the majority of the nation has rallied to the support of the party in power was evidenced both in parliament and without during 1901. Early in March the Chamber, by a vote of 346 to 117, expelled the National leaders, MM. Déroulède and Marcel-Habert, and in the by-election that followed M. Déroulède's seat was won by the supporters of the ministry. In the elections for members of the departmental councils, which took place in the latter part of July, the Republicans gained 47 seats, and in the elections for the *conseils d'arrondissement*, which occurred at the same time, the Republicans won 67 seats. Proportionate gains were made by the Radicals and Socialists, so that in the total the position of the government party throughout the country was greatly strengthened.

Associations Bill.—The passage by the Chamber of Deputies, on June 28, 1901, of the associations bill marked an important incident in the long war waged in France against monastic principles and the interference, overt or hidden, of the Catholic orders in matters of state. The immediate cause of the associations bill was the position taken early in 1900 by *La Croix*, the organ of the Assumptionist monks. This paper, in supporting the candidacy of General Mercier, a Nationalist, for the Senate, abused the existing Republican government without stint. In return the government dissolved the order of the Assumptionists, which still further inflamed the clergy, and brought the whole matter to a direct and unavoidable issue. The government then determined upon further retributive measures. In an able speech at Toulouse, on October 28, 1900, M. Waldeck-Rousseau, the premier, said that excluding personality the religious orders in France were worth 1,069,000,000 francs in landed property held in mortmain. This wealth gave them great power, the more so as they conserved their ready cash by evasion of taxes. But the power so gained was employed to plot directly against the government, although it was evident that ecclesiastics who were "functionaries and stipendiaries" of the government were bound in honor and morality to preserve a decent respect for it. Moreover, the schools of the orders were used to breed up within the state a faction against the state; the pupils were trained in loyalty to the church alone; and history and fact were presented by the church for its own aims. Therefore, in order to preserve the independence of the republic, it was necessary for the ministry to introduce measures curbing the power of the orders and to insist upon these measures as a supreme political issue by which the ministry would stand or fall. One of these bills would direct that the qualifications for entrance to any special school of the state, or for appointment to any official state position, must include three years of preliminary study in a state school; the other bill would make direct governing laws and regulations for the religious associations. The second half of this programme, as embodied in the associations bill, passed the Chamber of

Deputies on March 29, 1901, by a vote of 303 to 220. It was then referred to the senate and passed on June 22, after amendment, by a vote of 173 to 99, and as amended was repassed by the deputies by a vote of 313 to 249.

Provisions of the Associations Bill.—According to the provisions of the associations bill, an "association" is constituted by an agreement between two or more persons to work together for a common end other than that of pecuniary profit. Such associations, by which are primarily meant religious organizations, are in general legalized by the bill and are placed "under the general principles of law applicable to contracts and obligations." But associations whose spirit is contrary to the laws, to the constitution, to public order, to morality, or whose statutes entail renunciation by their members of natural and individual rights, are to be declared null and void by the civil tribunal, either with the consent of all concerned or at the instance of the public prosecutor. Moreover, except by the express authorization of the government, there may not be formed, nor continued where already formed, any association either (1) between French subjects and foreigners, or (2) between Frenchmen and Frenchmen, if "the headquarters and directorate are located abroad or intrusted to foreigners." Members of an association not formed for a limited period are given the right to withdraw from it at any time and notwithstanding any rule of the association to the contrary. Associations which may be formed in the future must, on demand of the proper authority, declare their constitutions, statutes, and by-laws, and any modification of these made by associations already existing must also be declared. In case an association is dissolved by the state, specific bequests shall be returned to the donors or their heirs, and the state shall take over the residue of the property, except that provision shall be made for those members "who have no sure and regular mode of existence, or who can prove that they have contributed to the acquisition of the common riches of the order." This last clause, as appears upon its face, is intended to relieve that numerous class in the religious orders who entered young and poor, lost their taste and aptitude for gaining a livelihood in the outside world, and who, while totally dependent upon charity or their superiors for sustenance, have nevertheless, by their toil, devotion, and self-sacrifice, created a large amount of wealth belonging to the common order and described as "unclaimed."

Politically the passage of this bill was a defeat for the monarchists and reactionists, with whom the Catholic orders are rather closely allied. Directly, however, it was aimed against orders like the Jesuits, the Dominicans, the Carmelites, and the Capuchins, and constituted, in the opinion of the ministry, a declaration by France that she would maintain her independence and resist covert denationalization of her citizens. In a larger sense the bill seems to have been considered a protest against the international policy of the leaders of Catholicism. That policy has been frequently avowed to be the regaining of temporal power in Italy and the maintenance of temporal influence elsewhere, and particularly in the so-called Catholic countries of Europe. But France is the richest and most powerful of the Catholic countries, and shelters the greatest number of Catholic subjects. Moreover, owing to the position of France in European politics, Catholic prestige there is of extreme strategic value. Hence the special significance of the associations bill.

The Effect of the Law.—At the time of the passage of the associations bill there were in France 16,468 religious establishments, containing at a rough estimate some 400,000 members. Upon the great majority of such institutions the new law imposed no great hardships, for as a general rule the provisions of the act were intended not so much to effect a radical change in the constitution of the religious establishments as to give legal sanction to their prevailing organization and to bring them more closely under the control of the government. In placing all religious bodies under the jurisdiction of the bishops, the law, as generally interpreted, effected nothing new, since at all times religious communities owning no foreign affiliations had been subject to the supervision of the bishop in everything save the details of internal management. Neither was there any difficulty involved in the requirement that before authorization could be granted to any institution the consent of the municipal local authorities should be obtained; for though Radical and Socialistic communities might in some instances refuse their consent, as did happen at Lille, Avignon, Carmaux, and Auxerre, the government was in no manner bound by the action of the local authorities, and in any event such cases were very few. The mass of the French people had no ill-will for the religious congregations which constituted an important social element of the life of the nation, and in whose hands the education of the youth was largely vested. In many places the prosperity of the entire community was inseparably connected with some wealthy abbey or monastery; in a large number of the rural districts the congregations were the principal owners of the soil, and both as capitalists and desirable customers were assured of kindly treatment at the hands of the prudent *bourgeoisie*. When the bitterness of feeling aroused by the struggle over the bill had subsided in some measure, people began to recognize that the law had probably brought as

Disorder in Clergy

much good as evil to the congregations, and that what had been lost in freedom of action on the part of individual religious communities was compensated for by the security of title and possession lent by the provisions of the new enactment.

What has been said of the orders in general, however, was not true of those orders which stood under the control of some superior abroad. Against these, as has been stated, the regulations of the bill were evidently directed, and though it was possible in some degree to evade those regulations, they could not be openly defied. While the French congregations therefore reluctantly but steadily began to apply for official authorization, many of the foreign orders prepared to leave the country. The law had fixed October 3, as the last day upon which application for authorization might be made. By that time only 5,141 establishments had taken advantage of the act, but when the government proceeded promptly to appoint receivers to take possession of the property of the delinquent orders, the numbers of requests for authorization rose in one week to 8,800 and there it stopped. Among those who submitted to the provisions of the act were establishments belonging to the Franciscans, Dominicans, Capuchins, Trappists, Redemptionists, and the fathers of the Grande Chartreuse. The Jesuits, Assumptionists, Benedictines, and the Carmelites abandoned the country for Belgium, Luxemburg, Spain, Italy, and Great Britain. The Jesuit schools in Paris, however, were reopened under new teachers, and the work of instruction was continued practically on the same lines. Abroad the members of the recusant orders met with no gratifying welcome. In Belgium they were received with suspicion by their own brethren, who for their own protection hastened to impose numerous restrictions upon them. In Spain the fugitives were prevented from settling in the country by express decree of the government.

The French Socialists.—During the debate on the associations bill the opponents of the measure repeatedly asserted that the ministry had been actuated in its attack on the religious congregations by the desire to propitiate the extreme Radicals, and especially the Socialists, among its supporters. Though there was little truth in the charge upon the specific point, the influence exerted by the Socialist party on the course of the government in general was undoubtedly great during the year, and this in spite of the dissensions among the Socialists themselves. The conflict which had been going on for two years between the revolutionary wing of the party, led by Jules Guesde, and the Opportunistic or ministerial faction, under Jaurès, came no nearer a settlement in 1901, and it required all the skill of the Socialist leaders in parliament so to stretch the party conscience as to make the presence of a Socialist in a *bourgeois* cabinet seem righteous and reasonable. The national congress of Socialists, which assembled at Lyons on May 8, 1901, declared, by 910 voices against 286, that M. Millerand had not placed himself outside of the party by accepting office under Waldeck-Rousseau, but decided at the same time, by 904 votes to 42, that the presence of M. Millerand in the cabinet could not determine in any way the attitude of the Socialist party to the government, and that the action of the Socialist deputies must be guided entirely by the interests of the proletariat. To a large section of the party, however, juggling with moral principles was extremely obnoxious; the regular annual secession of the Guesdites, the Blanquistes, and other extreme factions occurred on May 31, and there was much talk of the formation of a new party based on the principles of revolutionary and uncompromising class struggle.

In parliament, however, the Socialist group remained practically compact, and was still able to dictate in a large measure the policy of the government. This was especially apparent in the mooted questions of labor legislation, which played a prominent part during the year. In the spring of 1901 there was a growing restlessness among the working classes all over the country. At Montceau-les-Mines the chronic strike of the miners was attaining formidable proportions. In Marseilles, during the latter part of March, 18,000 longshoremen and laborers quit work, and the strike was marked by frequent outbreaks of disorder which often necessitated the calling out of the police. The government was placed in a very embarrassing position by the action of the laboring classes. On the one hand there was the manifest duty of preserving law and order and guarding the interests of property; but there, too, was the danger of antagonizing by undue severity its radical supporters in the chamber. The aggressive conduct of the labor representatives served to increase the difficulties of the cabinet's position, as when, on March 16, the Miners' Union of Montceau-les-Mines requested the chamber to receive certain delegates of theirs and to listen to their account of the true state of affairs in the matter of the strike. Waldeck-Rousseau, with his usual *finesse* , managed to tread his way safely between the two parties and to pursue a policy conciliatory to both. The representatives of the Socialist classes were placated by such action on the part of the chamber as the voting of 100,000 francs for the support of the families of the strikers at Montceau-les-Mines; and though in the middle of April the prospects of a general strike seemed very imminent, the policy of the govern-

ment was so far successful as to postpone, if not to avoid, the outbreak of such a conflict.

In general the agitation carried on by the miners' unions had for its object the attainment of an eight-hour working day, the fixing of a minimum daily wage, and the enactment of an old-age-pension law. Of these three points the cabinet was inclined to yield on the first two, and during the summer the question of old-age pensions was discussed at length. The scheme advanced provided, in general, that a fund should be created, partly by contributions from the employers and partly by weekly deductions from the laborers' wages, from which stipends, graduated according to years of service, were to be granted to such employees of the mines as were officially declared superannuated. The part to be played by the government was to guarantee an annual income of 3 per cent. upon the capital of the fund. Speaking on June 18, M. Caillaux, minister of finance, declared that the cost to the government at the beginning would be 15,000,000 francs; that the expenditure would rapidly rise to 90,000,000 as pensions became due; but that in the course of time it would sink to a normal outlay of 45,000,000 francs as the total capital of the fund, and with it the income upon it, increased. The minister stated that to meet this large increase in the national expenditure it would be necessary to practice economy in other branches of the public service. No definite action was taken upon the bill before the chamber adjourned in the fall; but when they reassembled on October 22 it was moved by a Socialist deputy that the question of an eight-hour working day, old-age pensions, and a minimum wage be declared urgent. In opposing the motion M. Waldeck-Rousseau declared that the government was absolutely opposed to the minimum-wage proposition, but that it stood ready to consider, though not in the immediate future, the question of pensions and an eight-hour day. The ministry was supported in its attitude by a vote of 290 to 245, and in view of the gravity of the subject under consideration there was considerable shifting of parties. The conservative wing of the Republicans, under Méline, which ordinarily constitutes the backbone of the Opposition, sided with the government on an issue which seemed to transcend party interest and to affect the entire scheme of economic organization. A large number of Socialists and Radicals, on the other hand, voted ~~the~~ ^{against} the ministry upon the question that presented in such a clear-cut manner politics ~~stands~~ ^{of} the laboring classes. This was the most serious problem of internal affairs which the government was called upon to face during the year, and as has been chiefly the case with this miscellaneous ministry, the cabinet owed its preservation followed by no fear both in radical and conservative circles that its fall would country at large. Out ~~s~~ ^{side} advantage to themselves and very probably by harm to the by a fresh agitation on the ~~the~~ ^{part} parliament Waldeck-Rousseau's declaration was met strike to force the government ~~in~~ ⁱⁿ the miners' unions and threats of a general the public favor the chamber on November 14 passed a bill establishing a ten-hour penditure of 68,000,000 francs for the govern. that this would involve an extra ex-

The Czar in France.—The close relation between France and Russia was emphasized during the latter part of September, 1901, by the visit of the Czar to France. In view of the present delicate balance of power in Europe resulting from the approaching termination of international relations (1903), this reassertion of the friendship existing between Russia and France was especially welcome to the latter. The visit of the Czar had been long expected in France, and was preceded by a journey which the foreign minister, M. Delcassé, undertook in a way, prior to St. Petersburg, where he was received with great cordiality by the Emperor. The announcement of the Czar's coming on August 20 was received with expressions of general satisfaction. A majority of the councils-general congratulated the President upon the happy event, and the only discordant note in the harmonious national rejoicing was struck by the general committee of the Socialist party, which called on all faithful members of the party to abstain from any favorable manifestations during the visit of the Czar. The Emperor and Empress landed at Dunkirk on September 18, after reviewing the French fleet outside of the harbor. They were received with great enthusiasm by the population, and at the banquets, formal and informal, which followed, many toasts of friendship were exchanged between the President of the French republic and his imperial ally. On September 19 the Czar was present at the manoeuvres of the Army of the East, near Compiègne, and visited the cathedral of Rheims. The following day he arrived at Compiègne, and was installed in the magnificent chateau in that town which had been prepared for his occupation. The next day at Betheny, near Rheims, he reviewed 160,000 men composing the Army of the East, and on the same day departed for home by way of the North Sea and the Baltic. At the formal banquet at Compiègne President Loubet, in toasting the Czar, said: "No doubt can exist as to the fact that the alliance had its origin in a desire for peace, and no one can deny that the alliance

has contributed to the preservation of the balance of European power—the necessary condition of peace. The alliance has grown with years, and as questions have arisen it has shown itself alert, determined, true to its own interests and to the interests of the world.” Replying to President Loubet, the Czar remarked: “The ties that bind our nations have been strengthened and have received a new consecration through the tokens of hearty sympathy which greet me here and find their echo in Russia. The intimate connection between the two Powers, animated by the most sincere desire for peace and mindful not to intrude on the rights of others though careful of their own, is a powerful element in the preservation of universal peace.”

The point upon which both speakers dwelt so persistently—namely, that the alliance had been the means of preserving peace in Europe—was the one which appealed most to the French nation, and on the whole approximates the truth. There is no doubt that after 1880 many Frenchmen sincerely believed that Germany, disturbed by the rapid powers of recuperation France had shown after the war, would attempt to force another conflict upon the republic which should definitely destroy the power of her ancient rival. From this fate Frenchmen believed they were saved by the strength which the alliance with Russia lent them. Moreover, Russia's friendship not only insured France immunity from further aggressions on the part of Germany, but by freeing her from the fear of attack from across the Rhine it allowed her to enter upon the policy of colonial expansion which has become as dear to the hearts of Frenchmen as it has proved expensive. To these advantages must be added the prestige which French diplomacy, backed up by Russian force, has so recently gained in China. The French nation, then, was earnest in its welcome to the Czar; and, if there was any lack of sincerity in certain quarters, it was rather in the attitude of the Socialist leaders whose ostentatious hostility indicated a struggle between their feelings as Frenchmen and their principles as members of an international party.

The Sultan and the Quays.—In the latter part of August, 1901, the French government became involved in a dispute with the Porte, in which M. Delcassé, the foreign minister, displayed his usual sagacity and energy and reaped his usual measure of success. The trouble originated in certain claims which a French company held against the Porte and for which they could obtain no satisfaction. The company, for valuable consideration, had received permission to build a system of quays in Constantinople, but after they had completed their work the government refused to transfer to them the title to the lands and to the waterfront, the argument for the position taken by the Porte being that the Sultan's life would be endangered by the influx of strangers that would follow upon the opening of the new docks. The company thereupon offered to sell the quays to the government, and the authorities took possession of the property but failed to pay. Repeated requests for satisfaction made through the French ambassador were met by the national Turkish argument of procrastination and excuse. In addition to the claims of the quay company, there were large sums of money due to two French citizens named Lorando and Tubini, who had advanced the funds for the construction of railways in various parts of the country. The French minister at Constantinople, M. Constant, was persistent in his demands on the Turkish foreign office. His action, however, not only failed to produce any result, but awakened the hostility of the government against French citizens throughout the empire, and the Turkish authorities entered upon the systematic persecution of the French religious establishments in Asia Minor and Palestine. After considerable haggling, matters were finally adjusted in an interview between the French ambassador and the Turkish foreign minister, in the presence of the Sultan, but at the last moment the Turkish government went back on its word and seemed intent on entering once more on the weary round of pretence and palliation.

On August 26 M. Constant left the city, and though the other members of the embassy remained behind, diplomatic relations were definitely broken off. After the arrival of Constant in Paris, August 29, the French foreign office sounded the various Powers, and found that there would be no opposition to an energetic move on the part of France against the Porte. On November 5 a squadron, under Admiral Caillard, took possession of three custom houses on the Island of Mitylene, but held them for six days only, as the Sultan, convinced that there was nothing further to be gained by delay, conceded all the demands of the French government. In detail the terms of the agreement were as follows: (1) The Turkish government recognized the legal existence of all schools throughout the empire managed by the French or under the protection of France, and exempted such schools from taxation; (2) it recognized the legal existence of all the churches, hospitals, and asylums under direct French control or under French protection, and exempted such institutions from taxation; (3) it permitted the founding of new schools throughout the country; and (4) recognized as legal all French eleemosy-

nary institutions that might be erected in the future, if no objections were made by the Turkish authorities within six months. The fiscal claims were met by a lien granted on the customs. On November 20 M. Constant returned to Constantinople, and on November 29 was received in official audience by the Sultan.

Colonial Policy.—In 1901 an important advance was made in the development of French colonial policy by the institution of a separate budget and financial administration for Algeria. This act marked a departure from the old policy of centralization which, in the opinion of many judges, has proved one of the greatest obstacles in the way of French colonial development. The problem that has confronted the supporters of a colonial policy in France up to the present has been the difficulty of maintaining distant possessions and developing their natural resources without a body of French inhabitants as a nucleus of power. Frenchmen have in fact shown almost no desire for emigration and very little capacity for adapting themselves to conditions in new countries. Financially the French colonies have been a burden upon the mother country. The annual budget for the colonies has averaged during the last few years about 130,000,000 francs, and of this large sum the greater part is spent on the maintenance of the military and naval establishments, and comparatively little upon the internal development of the colonies. In 1901 the appropriations for the colonies amounted to 111,000,000 francs (of this 90,000,000 for military expenses), and if the supplementary grants be added the total expenditure would attain the usual amount. For 1902 the appropriation asked by the government was 116,000,000 francs, with a probable total expenditure of 140,000,000 francs. In return for this outlay the government has been able to show no direct compensation, and the only justification for the continuance of such an expensive policy has been the benefit which French commerce supposedly derives from such a course. So far the balance of trade has not been sufficiently in favor of France to compensate even in measure for the sacrifices made by the government, and figures show that up to 1899 the greater part of the volume of trade in the French colonies passed through the hands of foreign nations. At the same time there has been a steady though slow development in favor of French mercantile interests. In 1900 the imports into the French colonies from France amounted to 203,200,170 francs; from French possessions 12,886,489 francs; and from foreign countries 209,459,657 francs. For the first time this showed an excess of French importations over foreign commodities. The exports during the same year from the French colonies were: to France, 152,288,411 francs; to French possessions, 8,277,711 francs; and to foreign countries, 169,664,100 francs; and though the exports still showed a slight advantage for foreign interests, the difference in their favor was by no means as pronounced as in the preceding years.

How unwilling Frenchmen are to abandon their native land for new countries is shown by statistics which, so far as obtainable, indicate that in 1899 487 men, women, and children left France for the colonies. In 1900 the number rose to 593. Including Algeria and Tunis it is probable that not more than 2,500 Frenchmen annually go to swell the colonial population, and these are more than offset by the large number of colonials that are constantly settling in France. The reluctance to emigrate continued in spite of various inducements offered both by the government, in the shape of free land grants in Africa and Indo-China, and by the offer of free transportation to any part of the colonial empire on the part of shipowners. It would seem, then, that if the French colonial empire is to be preserved and strengthened it must be grounded, not upon a European population transported to Asia or Africa, but upon the bulk of the native population, which must be conciliated by a liberal but firm policy.

It was partly because French statesmen have recognized the necessity of adopting such a course of action that the separation of Algeria from France, so far as financial administration is concerned, was effected. The change was made on June 3, when the financial delegations began to vote the budget for the colony. The delegations are composed of 69 members, of whom 48 are French colonists and 21 natives. Contemporaneous with the separation of Algeria from France, a process of decentralization was entered upon within Algeria itself. The administration was greatly simplified, and much of the power formerly vested in the governor-general was transferred to the prefects, upon whom was enjoined the strict supervision of municipal affairs in their various departments. The necessity of conceding a greater measure of rights to the native population had been shown during the year by a spirit of unrest among them. See ALGERIA.

Other events connected with colonial policy during 1901 were the establishment of a West African bank for the purpose of doing business in Senegal, French Guinea, the Ivory Coast, Dahomey, and French Congo. Railway lines were projected from Ain Sefra to Igli, and from Fahs to Kalaa-es-Senan, in Africa. In January a road from Antananarivo, in the interior of Madagascar, to the sea, was opened. The French possessions in Central Africa were divided for administrative purposes

into three territories—the North Soudan, Volta, and the region between the Niger and Lake Tchad, all three dependent on the governor-general of West Africa. More important, in the opinion of the government, was the initiation of a system of submarine cables to connect all the French possessions with the mother country. Up to the present, the foreign office has been at a disadvantage in being forced to make use of foreign cables for the purposes of communicating with the colonial authorities. In the case of war such a state of affairs would, of course, be extremely unfortunate for France. In 1901 cables were being laid from Thu-nan, in Indo-China, to Amoga—a distance of 800 kilometres—and from Amoy to the Russian port of Vladivostok.

FRATERNAL ORGANIZATIONS, a title usually applied, or understood to apply, to those secret societies which maintain a death, sickness, or accident fund for their members. Many of these societies are under the surveillance of the State insurance departments, which exact from the governing bodies such an amount of statistical information as tends to check betrayal of trust. Below is a list of the principal organizations in this country:

Name.	Date of Foundation.	Membership.	Benefits Disbursed Since Organisation.
American Legion of Honor.....	1878	7,600	\$41,776,898
Ben Hur, Tribe of.....	1894	67,428	930,785
B'nai Brith, Independent Order of.....	1843	30,000	.....
Brith Abraham, Order of.....	1859	19,457	1,477,687
Catholic Benevolent Legion.....	1881	41,984	12,767,911
Catholic Knights of America.....	1877	24,000	10,750,000
Druids, United Ancient Order of.....	1839	17,354	4,727,811
Elks, Benevolent & Protective Order of.....	1868	100,000	1,100,000
Foresters, Ancient Order of.....	1836	38,320	116,000,000
Foresters of America.....	1864	195,206	8,520,706
Foresters, Independent Order of.....	1874	187,000	10,600,000
Free Sons of Israel, Independent Order of.....	1849	12,000	66,685,000
Good Fellows, Royal Society of.....	1882	9,000	4,458,000
Heptasophs, Improved Order of.....	1878	52,462	6,020,404
Hibernians in America, Ancient Order of.....	1836	152,864	.....
Home Circle.....	1879	5,800	2,306,000
Irish Catholic Benevolent Union.....	1869	14,000	2,124,208
Knights and Ladies of Honor.....	1877	53,736	17,648,688
Knights of Honor.....	1873	59,932	74,234,577
Knights of Malta.....	1889	26,000	.....
Knights of St. John and Malta.....	1883	4,017	419,516
Knights of the Golden Eagle.....	1873	70,000	.....
Knights of the Maccabees.....	1883	227,936	11,608,446
Ladies' Catholic Benevolent Association.....	1890	71,668	1,833,327
Mystic Circle, The Fraternal.....	1884	16,500	1,942,606
National Provident Union.....	1883	3,109	1,871,026
National Union.....	1881	60,328	14,018,218
New England Order of Protection.....	1887	29,125	2,708,854
Pilgrim Fathers, United Order of.....	1879	22,747	4,123,930
Rechabites, Independent Order of.....	1835	270,000	793,682
Red Men, Improved Order of.....	1834	260,459	17,360,714
Royal Templars of Temperance.....	1870	23,641	7,932,750
Scottish Clans, Order of.....	1878	6,446	725,000
United American Mechanics, Order of.....	1845	47,011	.....
United American Mechanics, Junior Order.....	1853	103,786	3,895,528
United Workmen, Ancient Order of.....	1868	420,000	112,044,000
Woodmen of America, Modern.....	1883	642,957	23,250,449
Woodmen of the World.....	1891	252,130	11,350,220

FREDERICK, VICTORIA ADELAIDE MARY LOUISA, dowager empress of Germany and princess royal of Great Britain and Ireland, died at Kronberg, August 5, 1901. She was born in England, November 21, 1840, the eldest child of Queen Victoria and Prince Albert, and received a careful and thorough education under the personal supervision of her parents. She was married in London, January 25, 1858, to the Crown Prince Frederick William, of Prussia, who succeeded to the throne of Germany, March 9, 1888, and died June 15 of the same year. Of the eight children resulting from this union, six survive, including the present Emperor William. As wife of the crown prince, and, later, as empress, her influence over Frederick William was evident in many of his actions and caused a bitter and long-continued

conflict between herself and Bismarck. She was accused of attempting to introduce into Germany the liberal political principles of her early education, and, though this accusation was denied by those who were in a position to know her political motives, the discussion of it has filled many columns of the German press. During the Franco-Prussian War, her influence over Frederick William was apparent in his refusing, at her request, to bombard Paris; and this was designated an "act of unjustifiable interference" by Bismarck. In all affairs of state it was evident that the peaceful spirit of the crown princess, later empress, was in continuous conflict with the "blood and iron" policy of Bismarck, a controversy which was the cause of great sorrow to the empress. Upon the accession of the present emperor an estrangement arose between him and his mother, commonly attributed to the stand he seemed to be taking in regard to the conflict with the chancellor. Although he had been carefully trained by the latter to disdain everything English, in the hope of discontinuing the empress's course, filial affection operated with different effect, and in 1892 Bismarck was summarily removed. Whether this step was merely the culmination of the long controversy between empress and chancellor, or whether other causes were represented, it is impossible to say, but the reconciliation of the emperor with his mother immediately afterward is an event which points to the former reason. Although bitterly opposed by the German press for her so-called attempt at the Anglicization of Germany, the splendid character of the woman, considered as a woman, and the terrible physical suffering she underwent just before her death, melted this antagonism, and her death was regarded as a national bereavement, the burial services being attended by scenes of the deepest mourning.

FREE BAPTIST YOUNG PEOPLE, UNITED SOCIETY OF, since its founding in 1888, has attained to a membership of 23,000 in 1901, distributed among some 500 young people's societies and 150 junior societies. It is a denominational union of all the young people's societies, the majority of which are Christian Endeavor bodies. In addition to general Christian work at home, the union maintains missionaries in India and Africa, of whom there were eight in 1901. President, E. P. Metcalf, Providence, R. I.; secretary, Harry S. Myers, Hillsdale, Mich.

FREEMASONS, represented by thirty grand lodges in the United States and British America, reported in 1901 a total membership of 877,762, showing a net gain of 20,185 over the preceding year. These grand lodges are affiliated with the English grand lodge, of which the Duke of Connaught is grand master (succeeding King Edward), and with the grand lodges of Ireland, Scotland, Victoria, New South Wales, South Australia, Cuba, and Peru, as well as with those of Austria and Germany.

FREE METHODIST CHURCH, organized in 1860, reports for 1901, 997 preachers, 1,034 churches, with property valued at nearly a million and a half dollars, and 28,858 members, including 3,180 probationers. It maintains a college and six seminaries, and has a publishing house in Chicago, the denominational headquarters. The annual conference of the church was held at Alexandria, Va.

FREMANTLE, General Sir ARTHUR JAMES LYON, British soldier, died at Cowes, England, September 25, 1901. He was born in 1835, the son of Major-General J. Fremantle, C.B., and was educated at Sandhurst. Entering the army as ensign in 1852, in 1860 he reached the rank of lieutenant-colonel, and was made assistant military secretary at Gibraltar. He was promoted major-general in 1882; in 1884-85 he was governor of Suakim; in 1885 he commanded a brigade in the Soudan expedition; in 1886-92 he became deputy adjutant-general at headquarters; in 1893 he assumed command of the Scottish district, and in 1894-98 he acted as governor of Malta. During his short administration at Suakim General Fremantle made an enviable record in rendering the district habitable, and throughout his service was known as a capable, conscientious officer. He attained the rank of full general in 1896.

FRENCH CONGO, a French colony in West Africa, extending northeastward from the coast to the French Soudan, and lying between Cameroon, on the northwest, the Egyptian Soudan on the northeast, and the Congo Free State on the east and south. Its northern boundary is formed by the districts of Wadai and Bagirmi, which were separated from French Congo in September, 1900, to form, together with Kemo and Kanem, the *Territoire militaire des pays et protectorats du Tchad*. (See FRENCH SOUDAN.) The area of the colony is estimated at 450,000 square miles, and the population at from 12,000,000 to 15,000,000. The inhabitants are Bantu negroes, Adumas, Rendais, Gallas, etc., and too lazy to be good workmen. The country is administered by a commissioner-general, whose seat is at Libreville, on the northern shore of Bagoon. He is assisted by two lieutenant-governors. The budget for 1900 balanced at 3,834,060 francs. In 1901, 2,078,000 francs were contributed to the budget by France. There has been organized a system of developing this rich but thus far unproductive region by means of concessions, of which more

than 40 have been granted, covering 761,240 kilometres. The grants range from 22,000 square kilometres to 140,000 square kilometres each. The industries are mainly the raising of rubber and the production of kola, palm oil, coffee, cacao, and piassava. The planters pay about \$40 a hectare for their land, and are bound to plant every five years at least 5 feet of caoutchouc for every hectare, nor is their possession finally confirmed until a fifth of their land has been made productive. Concessionaires who have taken up more than 10,000 hectares are bound to plant 55 feet of land with caoutchouc for every ton of rubber produced in their district. In order to encourage agriculture, the government gives absolutely to the planters land of which a twentieth is planted with cacao, coffee, vanilla, indigo, and tobacco, and of which the rest is planted with rice and manioc. In order to foster stock-breeding, the government gives land to the farmer who will raise for five years on this land two head of cattle or four calves for every hectare; if he raises elephants he is given a hundred hectares of land for every elephant. These concessions are in their infancy and have not begun to be greatly productive. In an article in *La Revue Politique*, M. Bouisson asserts that to develop a concession of from 5,000 to 10,000 hectares, \$200,000 is necessary. The development is hindered by lack of transportation facilities. There is a plan to build a railroad from Libreville to the Congo, but it has not yet been carried into execution. A telegraph line connecting Brazzaville with Loango, on the west coast, is complete, and provides direct communication with Libreville from any station of the English Atlantic cable.

A revolt broke out in French Congo at the end of July, 1901. The factories on the Ogowe, in which there were 50 Europeans, mainly Belgians, were reported to be surrounded by 18,000 natives. It was said that four Europeans had been killed. A gunboat was ordered up the river, but she was unable to reach the scene of the insurrection, owing to the lack of water in the channel. In the fall of 1901 a rising of the Grabouine cannibal tribes at Cape Lopez was suppressed by a French force.

FRENCH GUIANA, a colony of France on the northern coast of South America, has an estimated area of 46,850 square miles, and a population, not including mountain Indians and convicts, estimated at 30,000. The capital is Cayenne, on the island of Cayenne, off the coast, population 12,351. The colony is administered by a governor, assisted by a privy council of 7 members. There is a colonial council-general of 16 members. The colony sends one deputy to the French chamber. A military force of 371 French soldiers is maintained. The local budget for 1900 balanced at 2,498,439 francs (franc equals 19.3 cents). The subvention provided in the French budget of 1901 was 6,857,057 francs, of which 5,585,700 francs were for the penal establishment. Certain convicts receiving sentences for more than 8 years are deported to this establishment from France and French territory. They number about 4,300. There is very little agriculture, only about 8,800 acres being under cultivation. Rice, maize, manioc, coffee, sugar cane, indigo, cacao, and tobacco are the principal crops. The leading industry is gold mining; silver, iron, and phosphates are worked. The valuable forests in the interior have been little exploited. The gold exports in 1899 amounted to 81,715 ounces; rum, cacao, and phosphates are the other chief exports. The total exports in 1899 amounted to a value of 6,844,076 francs; the imports 10,039,731 francs. The foreign trade is mostly with France. There are regular steamship connections, and telegraphic connection with Georgetown, British Guiana. There are no railroads. There is a college at Cayenne.

FRENCH GUINEA, a colony of France on the west coast of Africa, lying between Portuguese Guinea on the north and Sierra Leone on the south, was increased in area by the reorganization in October, 1899, of the French possessions in West Africa. It now comprises, in addition to the protectorate of Futa Jallon, the districts of Dinguiray Siguiri, Kurussa, Kankan, Kissidugo, and Beyla. The area of these additions is about 47,000 square miles, so that the entire area of the colony now amounts to 95,000 square miles. The population, which was about 1,000,000, has been increased by the additions to 4,200,000, chiefly negroes. The chief of the administration is the governor-general of West Africa, whose seat is at St. Louis, in Senegal. The local administration is in the hands of a governor, whose seat is Konakry. The colony has rapidly become prosperous. The local budget increased from 1,571,000 francs in 1899 to 2,870,000 francs in 1900. The imports increased from 9,019,875 francs in 1898 to 15,441,710 francs in 1899, and the exports from 7,799,975 francs in 1898 to 9,461,496 francs in 1899. The principal products are rubber, gum, palm oil, rice, and millet. The bulk of this trade goes to France, but the proportion which goes to England is steadily increasing. Five steamship companies—two French, two English, and one German—visit regularly the port of Konakry, where a wharf extending into deep water is to be constructed for their accommodation. A railway from this town to the Niger has been begun.

FRENCH LITERATURE. *History and Biography.*—The general trend of historical research during 1901 followed rather closely along the lines established

in the previous year. The document, whether in the form of memoir, journal, or correspondence, is still high in favor, and popular interest in the period of the First Empire continues unabated. Nevertheless, there are a number of important works which show that these special tendencies are not being followed to the detriment of interest in general history. Noteworthy among these is the first volume of a bibliographical work by Auguste Molinier, *Les Sources de L'Histoire de France*, which ought to give fresh impetus to the study of French history, especially of the mediæval period. The present volume covers "L'Epoque Primitive: Mérovingiens et Carolingiens," and enumerates in methodical order the narrative sources of French mediæval history, indicating the principal memoirs and articles to be consulted upon each author and work mentioned. A unique contribution to the history of a still earlier period, dating back to the days of Cæsar's *Bellum Gallicum*, is Camille Jullien's *Vercingetorix*. This volume is a rather remarkable piece of erudition. While adhering strictly to the approved methods of scientific history, the author has succeeded in reconstructing a vivid picture of Celtic days, and especially of the personality of this early Gallic hero, who dared to dream of a Celtic fatherland, bound together by firmer ties than those of clans, or tribes, or leagues, and who devoted his life to the realization of his dream. Another important volume is Charles Diehl's *Justinien et la Civilisation Byzantine au VI^e Siècle*. M. Diehl's study is inspired by the pious wish to make us realize the extent of the debt which modern civilization owes to this old Byzantine emperor and lawgiver. Historians, from Gibbon on have recognized that Byzantium did inestimable service to Christendom down to the time of the fourth crusade, by patiently standing guard on the eastern frontier of Europe. But how much of the credit is due directly to Justinian, whose statesmanship made Byzantium what it was, is the task that M. Diehl set himself to show. A leap of several centuries brings us to a rather curious volume, rich in documentary material, *Henri IV. et les Députés de Genève*, by M. F. De Crue. From the days of Henry III. there had been regular diplomatic relations between France and the little Calvinistic republic in the Alps. But aside from its interest as a contribution to diplomatic history, the volume is full of unpublished letters and conversations which throw new light upon the complex character of Henry of Navarre. *Le Mariage de Louis XV.*, by Henri Gauthier-Villars, is a careful and exhaustive study of comparatively recent yet little-known events, and is based upon unpublished documents which go far toward clearing up certain obscure questions. A volume which has a personal as well as historical interest is *Le Dernier Bienfait de la Monarchie*, since it is the last literary work of the eminent historian, the late Duc de Broglie (q.v.), finished only a few days before his death. The purpose of the volume is to show that the neutrality of Belgium was the last service rendered by the house of Bourbon to France—a service which, the author claimed, had never been sufficiently recognized. Professor E. Glasson, who is *doyen* of the faculty of law at the University of Paris, has contributed an important volume to the constitutional history of France, *Le Parlement de Paris, son Rôle Politique depuis le Règne de Charles VII., jusqu'à la Révolution*. It is a work at once broad in spirit and minute in detail, and covers the subject much more exhaustively than the kindred studies of Messrs. Fayard and Aubert. Somewhat more than a year ago Victor du Bled published the first volume of his entertaining study of French social life, *La Société Française du XVI^e au XX^e Siècle*. The second part continues the subject with undiminished interest, down through the seventeenth century. The author has gone first for information to the preachers and moralists, who from the very nature of their calling have little else to show than the faults of their epoch. The other side of the picture is given in a series of delightful chapters devoted to The Salon of Mlle. de Scudéry, The Friends of Mme. de Sévigné, and others of that cultured group to whom Parisian society of that day owed its charm. Several other series of real importance received additional volumes in 1901. Among them are the second part of the Comte d'Haussonville's *La Duchesse de Bourgogne et l'Alliance Savoyarde sous Louis XIV.*; the sixth volume of Emile Ollivier's *L'Empire Libéral*, which treats of Poland and the elections of 1863, and devotes a lengthy chapter to Renan, Comte, and the philosophical tendencies of the period; and M. E. Zévort's *Histoire de la Troisième République*, Vol. IV., which covers the administration of President Carnot; and while it does not altogether fulfill the promise of its title, is, as far as it goes, an impartial and well-informed survey of the period.

Turning to the numerous biographies and memoirs dealing more or less directly with the First Empire, we must mention, in the first instance, Frédéric Masson's *L'Impératrice Marie-Louise*, which forms a continuation of the author's long series of picturesque historical monographs, following directly after his *Joséphine, Impératrice et Reine*. The Marie-Louise whom he sets before us is a stout, characterless woman, incapable of strong emotion, and to the last consistently misunderstood by Napoleon. The volume is at once a study of general history drawn in bold strokes and a biography marked by penetrating psychological insight. *Bernadotte, Napoléon*,

et les Bourbons is the title of a volume by Leonce Pingaud, which is really a careful biographical study of the extraordinary figure of Bernadotte, based upon unpublished documents preserved in Sweden and in the foreign archives of France and Russia. The widespread interest in this period has led even such a veteran novelist as Ernest Daudet to join the ranks of historians, with a volume on *La Conjuration de Pichegru*. He discusses the charge of treason against Pichegru in all its details, and by showing the untrustworthy character of much of the testimony, raises something more than a question of doubt in his favor. The second volume of the *Souvenirs du Vicomte de Reiset*, which covers the period from March, 1809, to June, 1815, contains some curious details of the intimate life of Napoleon, his family, and those who were closest to him, and especially of the Empress Josephine.

Few careers offer better material for entertaining memoirs than those of veteran diplomats, if only they are blessed with the happy faculty of recording what they have seen. A good example of this is *Un Diplomate Français à la Cour de Catherine II. (1775-1780)*, a sort of *journal intime* kept by the Chevalier de Corberon, who was *chargé d'affaires* during these years at the court of the great Catherine, and who gathered and recorded many a *chronique scandaleuse*. *Mes Souvenirs* is the laconic title of a volume by another French envoy, the Comte de Reiset, who adds the subtitle, *Les Débuts de l'Indépendance Italienne*. The author records impressions gained while he was attached to the embassy at Rome under Gregory XVI., and as *chargé d'affaires* at Turin during the war of 1848 and the beginning of the reign of Victor Emanuel. Two other volumes of kindred interest deserve mention—*Souvenirs de Carrière, 1855-86*, by the Baron de Michels, who has made an attractive record of his long and useful career, but, being a thorough diplomat of the old school, carefully refrains from any statement which might be construed as bearing upon current politics; and *Ce Que J'ai Vu*, by General Castrex, covering years of service in the Crimea, in Italy, in Mexico, at Metz, and at Paris. It is the personal narrative of one who was a gallant man and a valiant soldier, and whom a kindly critic has defined as "a belated *mousquetaire* under the Second Empire and Third Republic." The prevailing tone of the two volumes is a kindly humor, tinged with a shade of bitterness.

In turning from the lives of men of action to those of men of letters, we find several volumes of an autobiographical nature which demand rather special attention. First on the list comes Victor Hugo's *Post-scriptum de me Vie*, made up of pages dating mainly from his days of exile, a period when the poet's feeble health brought him especially close to "the side of mystery." The contents are a curious miscellany of meditations on man, God, and nature, interspersed with literary studies of Shakespeare, La Fontaine, Voltaire, etc. The editor, Paul Meurice, has called it "a sort of testament of the poet's thoughts, the sum of his experience and his wisdom, the last word of his literary criticism, and his religious philosophy." Another literary legacy of importance is *Notes et Souvenirs*, by Victor Duruy, covering the years from 1811 to 1894. The veteran historian has recorded his own life in these two bulky volumes down to the smallest detail, from his infancy, passed at Gobelins, down to his reception at the Academy in 1885. Not the least interesting chapters are those in which he describes, as eye-witness, the exciting events of 1830, 1848, and 1870, commenting upon them with admirable acumen and judgment. *Le Soir de ma Journée* is the second volume of posthumous memoirs by Jules Simon, forming a sequel to his *Premières Années*. It contains some interesting details of the Coup d'Etat, the Empire, the "18th of March," and the Academy. There are annotations by the author's son, Gustave Simon. Two new volumes in the Grands Ecrivains Français series must be mentioned—*Alexandre Dumas*, by Hippolyte Parigot, and *François Villon*, by Gustave Paris. The choice of M. Parigot was a happy one, since he has not only long made a study of the early dramatists of the nineteenth century, but he is already the author of a voluminous and admirably written volume on *Le Drame d'Alexandre Dumas*. M. Paris's study of Villon is not merely a scholarly and comprehensive biography, but is a vivid picture of the heterogeneous and corrupt society of Paris in the fifteenth century. *Ivan Tourgueneff d'après sa Correspondance avec ses Amis Français*, by Halperine-Kaminsky, is a work which ought to throw interesting light upon the Russian writer's literary development. It is well known that Tourgueneff made France a second home, and that many of his French friends exerted a strong influence upon his genius. M. Halperine-Kaminsky has succeeded in recovering the greater part of his correspondence with George Sand, Sainte-Beuve, Theophile Gautier, Gustave Flaubert, Taine, Zola, Maupassant, and many others.

Literary and Critical Essays.—The art of criticism flourishes in France to a degree unparalleled elsewhere, yet the published volumes of critical essays in 1901 include few works of real significance. *Etudes de Littérature et d'Histoire*, by Albert Sorel, includes on the literary side appreciations of Montaigne and Pascal, Taine, Sainte-Beuve, and Maupassant, and on the side of history, studies of Napoleon,

Waterloo, etc. *Figures et Caractères*, by Henri de Régner, has special interest for English readers, because it contains, in addition to estimates of Hugo, Michelet, Mallarmé, and other French writers, critical papers upon Oscar Wilde and Rudyard Kipling, a rather bizarre combination from the Anglo-Saxon point of view. A group of studies of English writers, by Mary Duclaux (Mme. Mary James Darmesteter), are collected under the title *Grands Ecrivains d'Outre-Manche*, and include papers on the Brontë sisters, Thackeray, the Brownings, and Rossetti. *Cinq Ans Chez les Sauvages*, by Ernest La Jeunesse, is a collection of studies on contemporary writers, written, as the title suggests, in a spirit of caustic criticism. A volume which may be heartily commended is *La Fenêtre Ouverte*, by Fernand Gregh, who is best known as the author of such delicate verse as *La Maison de l'Enfance* and *La Beauté de Vivre*. The present work, which includes appreciations of Hugo, Henri de Régner, Anatole France, Zola, d'Annunzio, and Rostand, is evidence that on some occasions a poet may become one of the best of critics. *Art et Littérature*, containing much about literature and very little about art, is the work of Michel Salomon, an unfamiliar name, although the author already has one volume of criticism to his credit. Loti, de Vogüé and Maeterlinck are some of the writers discussed in these pages. Adolphe Brisson's *Portraits Intimes* are too well known to need further attention than the brief notice that he has added a fifth volume to the series, with somewhat wider range of subject than usual, since it includes even a paper upon President Kruger.

Among the few literary monographs which deserve special notice is one upon *Les Classiques Imitations de Ronsard*, by Edmond Dreyfus-Brisac. The author makes it very clear that while the classic writers of the seventeenth and eighteenth centuries disdained Ronsard, they were not ignorant of him. On the contrary, the works of Malherbe, Racine, Corneille, and even Boileau himself, show a large number of passages which owed their inspiration to Ronsard, and in some instances were deliberately copied from him. *Le Théâtre Français avant la Période Classique*, by Eugène Régat, is another scholarly work bearing the stamp of original investigation. It deals almost wholly with the organization of the theatre, containing chapters on such subjects as the theatres of Paris from 1548 to 1635; the expenses and receipts; the actors; the public; the preparation of spectacles; and similar subjects. *Conteurs Florentins du Moyen Age*, by Emile Gebhard, is a sympathetic and intelligent study of the early Italian *conteurs*, including Francesco da Barberino, Boccaccio, Sacchetti, etc. Passing mention should also be made of Jean Bertheroy's *Eloge d'André Chemier*, a study crowned by the Academy; *Le Style Epistolaire*, by Vicomte de Broc, with special reference to the letters of Balzac, Voltaire, and Mme. de Sévigné, and a clever essay on the epistolary style of women; and *Sainte-Beuve Inconnu*, a collection of unpublished pages edited by the Vicomte de Spoelberch de Lovenjoul.

Poetry.—The poetry of the year 1901 may be quickly summed up, since it includes nothing that impresses one as being especially inspired or especially novel. M. Sully-Prudhomme (*q.v.*), who still adheres to the traditions of the Parnassians, betrays in his *Testament Poétique* his resentment against the younger group of innovators who are venturing to tamper with traditional metres. Another belated Parnassian is Albert Merat, whose *Vers le Soir* contains some charming verse composed strictly in accordance with the established rules. Jean Moréas, once a high-priest of symbolism, has quite changed his manner. There is little that is symbolic in *Les Stances*, but, on the contrary, a return to the simplicity of the language and manner of Ronsard. Simplicity is the keynote of the new school of poets, the school of which Francis Jammes is perhaps the chief exponent. Sincerity and exactness of expression are this poet's chief characteristics, but he refuses to be bound by any established rules either of taste or of metre. His latest volume is *Le Deuil des Primevères*, which has a touching element of almost childlike naïveté. Other volumes of verse which have won praise to a greater or less degree, include *Lumières Tranquilles*, by Adolphe Retté, who sings of nature, and sunshine, the dawn, and the twilight; *Paysages*, by André Dumas, verses pervaded with a spirit of mild melancholy and full of originality; *L'Arbre et les Vents*, by Joachim Gasquet, elegiac stanzas suggesting a comparison with the *Contemplatives* of Hugo; and *Le Coffret d'Ebène*, by Valère Gille, containing some verses of real harmony and nobility of thought, well worthy of the author of *Le Collier d'Opales*.

Fiction.—When we turn to novels, 1901 has been what may be termed a good year. New volumes by Bourget, Zola, the brothers Margueritte, André Theuriot, Edouard Rod, and René Bazin, are in themselves sufficient to make the year a notable one. *Travail*, the second of Zola's *Four Gospels*, can scarcely equal the popularity of *Fécondité*, which preceded it. It is perhaps best defined as a sort of epic poem in prose, celebrating human labor. But the human interest of the individual characters has been in part sacrificed through the author's absorption in the development of his somewhat visionary socialistic doctrines. Bourget's latest work,

Le Fantôme, deals with a theme which the Anglo-Saxon reader will naturally find repellant; but that does not prevent it from being an exceptionally profound and truthful study of the human heart. The central idea is this: A man who was for many years the lover of a married woman much older than himself, consoles himself after her death by marrying her daughter, whose resemblance to the mother amounts almost to a reincarnation. Instead of finding the happiness that he hoped for, he finds indescribable torture; for the memory of the dead woman, pushing in at all times like a phantom between him and his unsuspecting wife, urges him on to self-destruction and hastens the day when she, too, must learn the truth. M. André Theuriot has been exceedingly industrious of late. In less than two years he has produced three novels: *Illusions Fauchées*; a political novel of the early forties, called *L'Amie de Noël Tremont*; and *La Petite Dernière*, a picture of family life of to-day, where the mother's absorption in literary pursuits leaves her three daughters free to compromise themselves in reckless flirtations, until the hero, a type of chivalrous naval officer, appears just in time to fall in love with the youngest, "la petite dernière," and rescue her from the bad influence of her sisters. MM. Paul and Victor Margueritte have also been active, for they have followed up the recent triumph of their *Tronçons du Glaive*, the second part of their trilogy of the war of 1870, with a volume of short sketches, *Les Braves Gens*, which also deal with episodes of the same war. Among the novels which appeared during the autumn, scarcely any has made a more profound impression than *Les Oberlé*, by René Bazin. The theme is one which necessarily appeals to a French public, especially when treated with such perfect fairness and impartiality as M. Bazin has accorded it. It is the history of a French family in Alsace, some of whom remain unswervingly faithful to their former country, while others, the younger members for the most part, resign themselves little by little, becoming gradually, almost imperceptibly, Teutonized. The strength of the book lies in its obvious sincerity, and its attempt to present the case both from the French and German points of view. The title of Edouard Rod's latest story is *Mademoiselle Annette*. It has the same characters, the same scene, and much the same atmosphere as *Les Roches Blanches*. The heroine is one of those gentle, self-effaced personalities whose whole life is made up of obscure sacrifices, and who, when no longer of practical use to any one else, fades gently away, careful even in her death not to inconvenience others. A book which has recently scored a well-deserved success is *Les Robinsons de Paris*, by Georges Beaune, author of *Vendanges* and *Sainte-Nitouche*. It is a kindly satire upon those honest provincial folk who find themselves irresistibly drawn to Paris, and when there feel themselves more isolated, more hopelessly lost in the midst of the crowd than ever Crusoe in his desert isle. After these novels of undoubted merit, the choice becomes more difficult. *Un Mari Pacifique*, by Tristan Bernard, is the logical sequel to that author's *Mémoires d'un jeune homme rangé*. It is praised for the truth of its minute details, while its humor is of the variety which lies on the borderland of pathos. Mme. Jean Berthéroy has recently preferred to go to antiquity for her themes, but the scenes of *Le Mirage* are drawn from contemporary life. She takes her heroine fresh from the convent, at the moment when the illusions of life flourish on every side, and when she is most prone to mistake the pleasures of the senses for true happiness. She is fortunate, however, in having a wise and patient husband, whose tenderness eventually awakens a responsive chord in her heart. *Monsieur de Phocas*, by Jean Lorrain, is worth passing mention, if only for the bizarre nature of the plot. It is the story of a man who is dying because he seeks in vain in the eyes of every woman whom he meets for certain reflected rays of mingled green and blue light—a rare, indefinable shade, which he can never find, and which he must find before he can be at rest. Among collections of short stories are a few of rather more than common interest: *Le Sang de la Sirène*, by Anatole le Braz, simple yet moving tales of the Breton coast; *Les Amants Singuliers*, by Henri de Régnier, containing three grim tragedies of love; and *Contes Espagnols*, by Jean Richepin, which forms the fourth volume in a recently established series, *Contes de Tous les Pays*.

FRENCH SOUDAN includes the French possessions in Africa extending from Lake Debu, on the west bank of the Niger River, eastward across the continent as far as the Egyptian Soudan. The region is bounded on the north by the vast desert area of the Sahara, which is also under the protection of France, and on the south by the Ivory coast, the Gold coast, Togoland, Dahomey, Nigeria, and Cameroon, and it is in connection with French Congo on the southeast. The area of the French Soudan is in the neighborhood of 300,000 square miles, and the population is between 3,000,000 and 4,000,000. In 1899 portions of the west and southwest of this territory were divided, for administrative purposes, from the Soudan proper, and placed under the administration of Senegal, Dahomey, and French Guinea; and at the same time, the northern and northeastern part of the Soudan was divided into two districts under the administration of military officers. By the decree of September

5, 1900, a Military Territory of the Regions and Protectorates of the Tchad was divided off from French Congo, and placed under a commissioner, who is responsible to the commissioner-general in France. The new protectorate comprises the river-basin of Kemo, as well as the districts of Schari, Bagirmi, Wadai, and Kanem. This military territory has a separate budget, and its income is derived from taxes imposed on the natives. It supports an army of 744 natives, officered by French. There are 27 officers, 2 surgeons, and 63 French non-commissioned officers. The chief administrative authority of the rest of the Soudan is in the hands of the governor-general of French West Africa, who is resident at St. Louis, in Senegal. The most important city in this region is Timbuctu, on the bend of the Niger, a town of about 20,000 inhabitants. In 1901 the troops in the military territories numbered 8,400, of whom 4,760 were natives. The budgets of the two military provinces in the northwest are incorporated with the budget of Senegal. The budget of the rest of the Soudan balanced in 1899 at 3,238,500 francs the government appropriation of 1900 was 6,833,000 francs. The most important products are rubber and gum, but rice, millet, wheat, and peanuts are cultivated by the natives. The exports for 1898 were 3,700,000 francs, and the imports amounted to 10,800,000 francs. Most of the merchandise is imported through Tripoli and Morocco by caravan across the desert. Seven-tenths of the fabrics sent from Europe to Tripoli find their way to the Soudan. Among the other imports are wool, chiefly from Austria; cotton goods and other textiles, mainly from Manchester; sugar, from Austria; tea, from Malta; hardware and tin, from Germany, the hardware consisting chiefly of padlocks, hinges, small chains, iron bars, wire, etc.; and glasses and mirrors, plated jewelry (solid gold is not in demand), and imitation gems, which must be either red, white, or blue. The most important of all the imports is perfumes, and the yearly sales of these to the natives amount to \$80,000.

The forces of native tribes which have opposed the French administration, particularly in the Lake Tchad region, were scattered early in 1901 by the defeat of the forces under the sons of Rabah, a powerful chief who was killed in 1900. On August 23, 1901, a column of Spahis and infantry, under Captain Dangerville, defeated Fadl-ullah, one son of Rabah, and killed him, and two days afterward the other son, Neibe, together with 1,500 natives, surrendered. In the meantime, in Wadai, early in 1901, there had been an insurrection against Sultan Ibrahim, who fled and was assassinated. Sultan Ben Ali took his place and the civil war ceased.

FRENCH WEST AFRICA comprises, for purposes of administration, all the French possessions in Africa south of Algeria, except French Congo; namely, the Dahomey (*q.v.*). A governor-general, at St. Louis, in Senegal, is in charge of all these districts. Local governors administer the affairs of each colony or military district. The budgets of 1900 showed expenditures by the colonies in West Africa as follows: Senegal, 4,454,611 francs (for education, 355,976 francs; for public works, 661,442 francs); French Guinea, 2,870,000 francs (for public works, 810,000 francs); Ivory Coast, 1,403,000 francs (for public works, 218,000 francs); Dahomey, 2,000,000 francs (for public works, 622,220 francs). The appropriation of France for military service in West Africa for 1901 was estimated at 750,000 francs. The entire expenditure of the mother country on West Africa in 1901 was 13,650,446 francs. A West African bank was established in Paris, in 1901, to operate in all these provinces. (See FRANCE, paragraph Colonial Policy.) The development of large portions of this region has been retarded by the deleterious effects of the climate on Europeans. In 1901 a medical commission was sent by France to ascertain the causes of fever in the region, and to report as to the best measures for checking disease.

FRICK, HENRY CLAY, an American manufacturer, who became in 1901 one of the prominent members of the United States Steel Corporation (*q.v.*), was born at West Overton, Pa., December 19, 1849, and was educated in the common schools of Pennsylvania. He began his business career as a clerk in the store of his grandfather, who was a flour merchant and distiller. Later he went into the coke-making business, and by a process of combination his company gained control of a large part of the coke output of the United States. Afterward he joined the Carnegie Steel Company, serving as its president during the Homestead strike in 1892, when he was attacked and wounded by an anarchist. His name has been connected with various charitable enterprises.

FRIENDLY ISLANDS, a group of islands in the southern Pacific, 300 miles to the east and somewhat south of Fiji, constituting a British protectorate. They comprise three groups, Tonga, Haapai, and Vavau, with a total area of 374 square miles, and a population, in 1901, of 19,963 natives of Tonga, 350 other natives, 150 English, 89 other foreigners, and 120 half-castes. The capital is Nukualofa, on Tonga Island. Government is administered by a native king, George II. (Jioaji Tubou II.), and a legislative assembly of two houses, the upper composed of 31

hereditary nobles, who hold office during good behavior, and the lower of 31 representatives, elected for 3 years by popular vote. British interests are represented by a deputy commissioner, under the high commissioner and consul-general of the Western Pacific. Currency of Great Britain, Germany, and the United States is legal tender in the islands. The annual revenue, chiefly from customs, the poll tax, land leases, etc., is about \$100,000, which is expended so as to leave a small annual surplus. The principal products are copra, fruits, mats, tapa, combs, and fishing nets. Trade is carried on with Australia and various Pacific islands. The imports in 1899 were valued at £74,124, almost wholly from Australia and New Zealand. The exports amounted to £70,911, mostly to the same countries. Over 90 per cent. of the trade is British. The trade statistics of 1899 show that the islands were recovering from the great drought of 1897, the exports being even larger than for that year. In 1898 the effects of this disaster were seen in a falling off of the exports by over 40 per cent. and imports more than 50 per cent. The United States maintains a consul at Nukualofa.

FRIENDS, SOCIETY OF, a sect of Christians commonly known as Quakers, which has adhered consistently, since its origin in England in the seventeenth century, to a rigid form of discipline that has militated against a numerous membership. The Quakers, about 140,000 in number, are found principally in the United States and Great Britain, though there is a considerable body in Australia, and scattered adherents are found in many other parts of the world. In this country there are some 120,000 Friends, included in the four divisions: Orthodox, 93,204 members, with 1,279 ministers and 830 churches; "Hicksite," 21,992 members, with 115 ministers and 201 churches; "Wilburite," 4,329 members, with 38 ministers and 53 churches; and Primitive, 232 members, with about 10 ministers and churches. District yearly meetings are held regularly, and of recent years efforts have been made among the Orthodox Friends to effect closer association of the yearly meetings by means of a general meeting with definite powers, to be held at intervals of five years, the first of which will convene in 1902. The American Friends' Board of Foreign Missions, organized in 1873, directs its missionary efforts over a wide field, and in educational lines both the Orthodox and "Hicksite" Friends maintain active work, a feature of this department inaugurated in the past few years being the summer schools at Haverford and Swarthmore colleges. In the closing month of the year 1901 a peace conference was held in Philadelphia, the subject being one of common interest to all the various bodies.

FRYE, WILLIAM PIERCE, who became president of the United States senate upon the accession of Vice-President Roosevelt to the presidency, was born at Lewiston, Me., September 2, 1831, and graduated at Bowdoin College in 1850. After studying law and engaging in practice for some years he entered politics, and in 1861 was elected a member of the Maine legislature, to which body he was reelected in 1862 and 1867. In 1866-67 he was mayor of Lewiston, and in 1867-69 was attorney-general of the State. From 1871 to 1881 he was a representative in Congress, and in the latter year he was chosen as one of the United States senators from his State. In 1898 he was chairman of the senate committee of commerce, and was also a member of the Paris peace commission. He has been elected president *pro tempore* of the senate on several occasions, and was president once before, after the death of Vice-President Hobart in 1899. His advocacy of the ship-subsidy bill in the fifty-sixth and fifty-seventh Congresses, and his position as chairman of the committee on foreign relations, have also brought him into recent prominence.

FUKUZAWA, YUKICHI, Japanese educationist, man of letters, and philanthropist, died at Mita, February 3, 1901. He was born in the province of Buzen, in 1834, and after being educated in Chinese, went to Osaka, where he studied Dutch. Going to Yedo (now Tokio) in 1858, he accompanied Katsu Awa to America, and remained there several months, learning English and observing American institutions. Returning to Japan he entered politics, and in 1862 went with the Japanese embassy to Europe to obtain concessions with a view to limiting foreign trade with Japan and to postpone the opening of Japanese seaports until 1868. While in London he acquired a library of English and other books, and in 1866 published a work on *Western Manners and Customs* (*Sei Yo Jijo*), which attained wide popularity and which probably did as much to introduce Western civilization into Japan as any other influence. After a second visit to the United States he became an instructor in the government college at Yedo, and stayed there until the outbreak of the Civil War of 1868. In this year he founded a private school at Tokio, which under his control became one of the most important in the empire, rivaling even the Imperial University. From that time he labored continuously, through his books and a newspaper, the *Jiji Shimpō*, which he controlled, for the reconstruction of Japanese literary style. He wrote on a great variety of subjects, criticising fearlessly old opinions, customs, and traditions. He has been called the intellectual

father of half the young men of Japan. Throughout his career he declined many offers of government positions and titles, preferring to be called "the Great Commoner," by which title he was affectionately known.

FULLER, MELVILLE WESTON, chief justice of the Supreme Court of the United States, was made a member of the International Court of Arbitration in 1901. He was born at Augusta, Me., February 11, 1833, and graduated at Bowdoin College in 1853. After studying law at Harvard he was admitted to the bar in 1855, and established himself in practice at Augusta. For a time he was editor of *The Age*, a Democratic newspaper of Augusta, and in 1856 he removed to Chicago. In 1863-65 he was a member of the Illinois Legislature, and he was four times (1864, 1872, 1876, and 1880) a delegate to the Democratic national conventions. He was appointed chief justice of the Supreme Court in 1888.

FULLER'S EARTH. The production of fuller's earth in 1900 was 9,698 short tons, valued at \$67,535, as against 12,381 short tons, valued at \$79,644, in 1899. There has been a continued decrease in production since 1897, as well as a reduction in the quantity of imports. The latter in 1900 amounted to 8,173 long tons, valued at \$64,799. During 1901 some deposits were found in South Carolina and Virginia, which seem to be fully equal to the English material for bleaching cotton-seed oil.

FULTON, JUSTIN DEWEY, American Baptist clergyman, died at Somerville, Mass., April 16, 1901. He was born at Sherburne, N. Y., March 1, 1828, and graduated at the University of Rochester (1851) and the theological seminary there. Ordained to the ministry at St. Louis in 1854, he occupied pastorates in various cities of the United States and Canada, notably at the Tremont Temple in Boston, 1863-73, and the First Baptist church of Somerville, Mass., from 1894 until his death. Throughout his career Dr. Fulton was an ardent denominationalist and a tireless opponent of the Roman Catholic faith, against the spread of which he wrote and preached with vigor. Some of his works are: *The Roman Catholic Element in American History* (1857); *Witnessing for the Truth; or the Overthrow of the Papacy* (1879); and *Rome in America* (1884).

FUNSTON, FREDERICK, brigadier-general U. S. A., attracted widespread attention during 1901 by his sensational capture of the Filipino rebel leader, Aguinaldo (q.v.), on March 23. He was born in Ohio, November 9, 1865, and was educated at the Kansas State University. In 1890 he began newspaper work at Kansas City, but left it to join a government expedition to the Death Valley in 1891. After two years' experience as a special commissioner to Alaska, 1893-94, he went in 1896 to Cuba, where he served for a year and a half with the insurgent forces and was wounded in action. Returning to the United States in 1898, he was made colonel of the Twentieth Kansas Volunteers and went to the Philippines. For gallantry in action in an engagement at Calumpit he was made brigadier-general of volunteers, May, 1899. In March, 1901, he intercepted certain letters disclosing the whereabouts of Aguinaldo, who was then at Palanan, in the island of Luzon. He organized a party, made up of seventy-five Macabebe scouts who were loyal to the United States, and four American officers, who accompanied the natives ostensibly as prisoners. Reaching Palanan, General Funston directed the Macabebes to notify Aguinaldo that they brought five American soldiers as captives, and to request the Filipino chief to receive them. When the party gained entrance to Aguinaldo's quarters, General Funston led the attack on the defending Tagalog force, routed it, and captured the leader. Marching Aguinaldo to Palanan Bay, General Funston put him aboard the U. S. gunboat *Vicksburg* and delivered him to the American authorities at Manila. For this service he was, on March 30, made brigadier-general in the regular army. While this exploit undoubtedly has had the effect of decreasing the resistance of the rebel forces in the Philippines, it has subjected General Funston to severe criticism for the method adopted by him.

GALEATI, SEBASTIAN, Roman Catholic cardinal, died at Ravenna, January 25, 1901. He was born at Imola, Italy, February 8, 1822, and was created a cardinal priest and archbishop of Ravenna in 1890.

GALLOWAY, Tenth Earl of, **ALAN PLANTAGENET STEWART**, died at Cumloden, February 7, 1901. He was born in London, October 21, 1835. He served in the Royal Horse Guards (1855-69), resigning with the rank of captain, and was a member of Parliament for Wigtownshire from 1863 to 1873, when he succeeded to the peerage. He was a Conservative in politics, and in 1876 and 1877 was appointed by Lord Beaconsfield high commissioner to the general assembly of the Church of Scotland.

GALT, Sir THOMAS, chief justice of the Canadian court of common pleas, died at Toronto, June 1, 1901. He was born in London, England, August 17, 1815; was educated in England and Scotland; and went to Canada at the age of eighteen. He was admitted to the Toronto bar in 1845, and took high rank as a criminal lawyer

before he was raised to the bench in 1869. He was chosen chief justice of the court of common pleas in 1887 and was knighted in 1888, six years before his retirement from the bench.

GAMBIA, the oldest British colony in Africa, lies on both banks of the Gambia River, extending from the coast into the interior about 200 miles. The original area of the colony proper was about 69 square miles; but in 1901, according to an agreement with the native chief, Mousa Mollah, an addition was made to the British territory, which now extends back to the French frontier. The entire present area of the colony is about 3,550 square miles. The population is estimated at 250,000. The country is governed by an administrator, with executive and legislative councils. The administrator in 1901 was Sir G. C. Duncan. The revenue of 1900 was the largest on record, amounting to £49,160, of which about four-fifths were represented by customs duties. The expenditure was £29,817; there was no public debt and the assets of the colony exceeded the liabilities. The imports in 1899 amounted to £240,906; in 1900, to £194,408. The exports for 1899 were valued at £241,936, and in 1900 at £240,705. The rubber industry has fallen off, and trade now depends almost wholly on the ground-nut crop.

In January, 1901, an expedition under Lieutenant-Colonel Brake set forth to punish the native tribes who had murdered two British traveling commissioners, Messrs. Sitwell and Silva, at Sankandi in the previous June. The expedition took the towns of Dumbutu (January 11) and Kwinella (January 12), and captured the principal leaders; and on May 9 three natives, convicted of complicity in the murder, were hanged. There was also disaffection in other districts, and the turbulent natives fled across the border into Senegal. A combined force of French and English attacked the chief, Fodi Kabbah, at his stronghold, Mandina, and took the town (March 23). The chief was killed, and the explosion of two magazines in the town caused the death of forty of his wives.

GARNETS. See **GEMS**.

GAS, ILLUMINATING AND FUEL. The number of gas works in the United States in 1900, according to Bulletin 123 of the Twelfth Census, was 877, located in 827 different cities and towns. Of the 877 works, 15, located in 15 municipalities, were owned by the city or town, and the remainder by private corporations. The combined capital of these 877 establishments amounts to about \$567,000,000, or an average of about \$646,500 per establishment. The average product in 1900 was 76,503,482 cubic feet of gas against 49,217,670 cubic feet in 1890. In the table given below the location of these plants is summarized by States. The price per thousand cubic feet ranges from \$4.50 in Nevada to 83.2 cents in the coal regions of Pennsylvania, the average price being \$1.035. In 1890 the average price was \$1.42. It is interesting to note that over 27 per cent. of the total amount of gas consumed was used in the city of New York, where the average price during 1900 was \$.905 per thousand cubic feet. Although it has been nearly a century since gas was first used in the United States, the growth of the industry was at first very slow, and as late as 1830 there were not more than a half dozen plants in operation, and for the census of 1850 reports were received from only 30 establishments. In 1860 221 establishments, having a combined capital of \$28,848,726, were reported; in 1870 the number had increased to 390, having a combined capital of \$71,773,694; and in 1890 to 742 plants, with a capital of \$258,771,795. Since 1890 there has been a development of one branch of the industry which is likely to have an important influence upon the future of gas manufacture. This is the coke-oven process, in which gas is a by-product. The increased use of water gas, also, has been far-reaching in its effects upon the gas industry. Water gas is made by a process in which hydrogen and the oxide of carbon, produced by the action of steam upon carbon at a high temperature, are mixed and then combined with richly carburetted gasses, usually from petroleum, thus producing the power of illumination. Water gas was first made in 1873. For many years it was bitterly opposed by the coal-gas manufacturers, but the opposition has gradually died out, and now many coal-gas makers have adopted the water-gas processes. It is estimated that fully 75 per cent. of all the gas now used is water gas. The sanitary aspects of this change from coal gas to water gas are discussed farther on.

Although the use of gas has increased 86.9 per cent. during the last decade of the century, the use of electricity for illuminating purposes has undoubtedly increased at a much more rapid rate, and has not only prevented the erection of new gas plants, but has been one of the causes of the dismantling of nearly 50 establishments during the decade. Of the 877 gas plants reported in the last census, 269, or 31 per cent., were operated in connection with the generation of electricity, and it was reported in many cases that the production of gas was attended with actual loss. The effect of electric lighting in checking the growth of the gas industry has been counteracted in part by the introduction of the Welsbach burner. This burner, or

incandescent mantle—named from its inventor, Auer von Welsbach, of Austria—produces an illuminating power of 20 candles per cubic foot. Other factors which have promoted the growth of the gas industry are the use of gas stoves for cooking and heating purposes, and also the increased popularity of the gas engine.

The names of the municipalities in which the fifteen publicly owned gas plants are located are, unfortunately, not given, but they are located as follows: Kentucky, 1; Massachusetts, 3; Michigan, 1; Minnesota, 1; Missouri, 1; Nebraska, 1; Ohio, 2; Virginia, 4; West Virginia, 1. Four of these plants are in cities having a population of more than 30,000. The following statistics concerning these four plants are taken from the *Bulletin* of the Department of Labor, issued in September, 1901, on statistics of cities:

NAME OF CITY.	Date works were built.	Date works were bought by city.	Miles of mains.	Cost.
Toledo, O.....	1891	(Built by city.)	98	\$1,180,000
Richmond, Va.....	1860	1861	78.8	961,181
Duluth, Minn.....	1896	1898	31.48	389,993
Wheeling, W. Va.....	1860	1875	40	409,716

Comparative summary of gas plants in operation in 1900 and 1890, from bulletin 123 of the twelfth census:

	1900.	1890.	Increase.	Constructed since 1890.
United States	877	742	135	66
Alabama	11	7	4	2
Arizona	3	2	1	2
Arkansas	7	7	..	1
California	41	44	3	1
Colorado	5	3	1	..
Connecticut	21	20	1	..
Delaware	4	4	..	..
District of Columbia.....	3	2	1	1
Florida	11	7	4	3
Georgia	12	11	1	4
Illinois	53	36	17	12
Indiana	39	33	6	4
Iowa	26	19	17	2
Kansas	17	12	5	..
Kentucky	17	14	3	..
Louisiana	3	4	1	..
Maine	9	11	2	..
Maryland	11	7	4	1
Massachusetts	68	72	4	1
Michigan	38	27	11	5
Minnesota	11	10	1	..
Mississippi	5	2	3	..
Missouri	25	17	8	2
Montana	2	1	1	..
Nebraska	9	9	..	..
Nevada	3	2	1	..
Nevada	3	2	1	..
New Hampshire.....	13	13	..	1
New Jersey	34	33	1	2
New Mexico	1	2	1	..
New York	101	94	7	6
North Carolina	10	6	4	2
North Dakota	2	2	..	..
Ohio	73	61	12	5
Oregon	5	4	1	1
Pennsylvania	89	73	16	3
Rhode Island	6	7	1	..
South Carolina	4	2	2	..
South Dakota	2	2	..	..
Tennessee	11	8	3	3
Texas	11	8	3	..
Utah	2	1	1	..

	1900	1890.	Increase.	Constructed since 1890.
Vermont	7	8	1	..
Virginia	12	6	6	1
Washington	6	4	2	1
West Virginia	8	3	5	1
Wisconsin	25	18	7	..
Wyoming	1	1	..	..

Sanitary Aspects.—Within recent years, and particularly during the last eighteen months, much attention has been given, both by sanitarians and by those interested in gas manufacture, to the sanitary aspects of the use of illuminating gas. The importance of this phase of the subject has been increased by recent changes in methods of gas manufacture and by the substitution of water gas for coal gas in many of our large cities. In water gas the most poisonous agent, carbonic oxide, is thereby increased from 6 or 7 per cent. to about 30 per cent. This change, however, was not necessary to make illuminating gas an active poison to breathe. The danger in the use of illuminating gas arises from two sources: (1) From unburned gas which escapes into the atmosphere through defective mains or fixtures or through burners accidentally open; and (2) from vitiation of the atmosphere by the products of burning gas. The first danger, that from leaking gas, was forcibly explained in a paper read by Dr. Durgin, health officer for Boston, before the New Jersey Association, and published in 1901 in the twenty-seventh annual report of the association. The subject was also discussed by William Paul Gerhard in an article first published in *Cassier's Magazine* and republished in pamphlet form. The National Board of Fire Underwriters, in a circular on *Gas Main Leakage Under Impervious Street Pavements*, furnishes a table of gas losses compiled from data furnished by fifteen companies, which shows that over 14 per cent. of the total product of gas plants leaks into the streets and houses of the cities supplied. Regarding the danger from gas thus lost, the report goes on to say: "Always a serious matter as affecting life and property, the evil is emphasized in many ways by the substitution of impervious pavements for the loose stone pavements of former times. Generally speaking, any pavement which is water-tight is practically gas-tight. The leakage of gas mains, which formerly worked itself to the surface and escaped into the air, too diluted to be dangerous, now follows the path of least resistance, which usually terminates in coal cellars and basements. Some of it gets into sewers and subways, as is shown by the comparatively frequent street explosions due to accidental or electrical firing. Nine such explosions occurred in one day in New York in the winter of 1900-01." The danger to houses from escaping gas is much greater in the winter time, when the street surface is frozen, and when houses, on account of their higher temperature, act as chimneys to draw in the ground air, and with it the gas which has leaked into the soil. Gas thus escaping may follow water or sewer pipes and enter even those houses which have no gas connection. The late Professor von Pettenkoffer relates a great number of instances where entire families have during the night been asphyxiated by gas entering the house in this manner.

The danger from defective gas plumbing within the house was pointed out in Dr. Durgin's paper. He gives several instances which came under his personal observation of whole families stricken with illness which was traced indubitably to defective gas plumbing, and adds: "From like sources I have been gathering material for some time, and shall, in a future report on the subject, be able to give data showing the extent to which tenants are made ill by illuminating gas which escapes in small quantities from faulty pipes and fixtures. I am, however, prepared to state my convictions, in advance of further data, that a faulty and leaky condition of gas pipes and fixtures within our dwellings, counting-rooms, and other inclosed spaces, is extremely common, and is without doubt the cause of much discomfort and illness, and that such ill effects are a hundredfold greater than has ever been caused by so-called sewer gas. If you should examine specimens of gas-pipe and gas fixtures which are to be found in the market and which are being used, you would find piping too thin to bear a respectable thread for connecting purposes, and you would find cocks and other fittings too light and otherwise faulty to be trusted for ordinary use. The cement in use for stopping leaks and sealing joints is readily dissolved in illuminating gas, and should be substituted by white or red lead." Dr. Durgin further states that in 1897 the legislature of Massachusetts passed an act intended to safeguard the people against the danger arising from poor material and workmanship in the matter of gas fitting. The act, among other things, requires gas plumbers to secure a license, which can be obtained only upon certain conditions and is subject to forfeiture. It also authorizes inspection of gas plumbing. Under the provisions of this act an inspection of different blocks in the city of Boston was inaugurated, and it was found that 80 per cent. of the houses inspected, both new and old, showed from 2 to 10 leaks.

In the *Medical Record* for February 24, 1900, it was stated that Dr. Haldane, one of the British departmental committee appointed to inquire into the manufacture and use of water and other gases containing a large proportion of carbon monoxide, pointed out that in the case of Boston, where 90 per cent. of the gas is water gas, about one in every 300 deaths is due to accidental gas poisoning, and the committee resolved that they would not allow in Great Britain more than 12 per cent. of carbon monoxide in illuminating gas. In order to remove the constant menace to life and property, through explosions and asphyxiation, which is afforded by leaky gas mains, the whole matter should be under the strictest public surveillance and control. The introduction, in our large cities, of subways for underground pipes and wires would remedy the evil by rendering gas mains easily accessible for constant inspection. In this way the slightest leak would be detected. There would also be removed the danger of deterioration of the mains through rust, and of their breakage through settlement of the soil. The hygienic aspects of gas consumption, a perfect distribution system being taken for granted, were discussed at the twenty-third annual meeting of the Western Gas Association, in May, 1900, by Thomas D. Miller, and at the twenty-fourth annual meeting of the same association, in May, 1901, by Jos. Ferrier. While it was conceded by both these gentlemen that the consumption of gas does vitiate the atmosphere of a room to a certain extent, it was shown that an ideal system of ventilation is possible to which burning gas is not a hindrance but an essential part. An example of such a system is found in the British House of Parliament, where, by means of flues placed over the jets, the heat or surplus energy of the gas flame assists in producing a pure atmosphere. Mr. Ferrier stated that at Brussels M. Bandsept had shown that a similar system of ventilation could be carried on with a 13-foot ceiling, in conjunction with the chimney of the room, and that Warrington, of England, had demonstrated that the combustion of one cubic foot of gas could be made by a suitable flue to change the atmosphere of a room 15 x 15 x 11 feet once per hour. In this event the 3 feet per hour consumed by an incandescent gas burner could be made abundantly to light and ventilate that space. Mr. Miller further attempted to show that the atmosphere of a room is actually improved by passing through a gas flame, but the contention was not sustained by the discussion which followed his paper. He said: "The dark spot on the ceiling which gradually appears and grows darker over a gas jet is ordinarily attributed to smoke from the gas, but such is not the case. These sooty deposits are nothing less than charred and inert particles of organic matter that have passed through the gas jet, and, rising with the current of hot air, have been deposited on the ceiling; and it is impossible to say how many millions of deadly disease germs are hourly cremated in this way." The character of light best adapted to the human vision was discussed by both gentlemen. Referring to the harm which the eyes suffer from a brilliantly lighted desk or table in an otherwise dark room, Mr. Miller said: "The result is constant contraction and expansion of the eye, which, if persisted in, will eventually result in nervous prostrations of its muscles, with accompanying evils. . . . I believe that nature is the greatest scientist of all, and she has provided every protection and shading of the eyes on the hypothesis that light comes from above; therefore we have longer eyelashes on the upper lid than on the lower, and most of us have heavy eyebrows, so the light shall not come from a level with the eye, but from above it in all cases." See ELECTROLYSIS OF GAS AND WATER PIPES.

GAS, NATURAL. See NATURAL GAS.

GASTERINE. In 1900 Le Gendre, of Paris, first suggested the use of the gastric juice of the dog in therapeutics. Frémont, of Vichy, prepared the drug for actual use, and gave it the name gasterine. In 1901 Le Gendre reported success with it in chronic dyspepsia with apepsia, in ordinary prolonged cases of gastritis, in post-operative indigestion, in vomiting of pregnancy, and in entero-colitis. Sarrade and Daudet employed it successfully in cases of hepatitis, and Rendu and Frémont also testify to its efficacy in various forms of indigestion. Albert Mathieu and Laboulais found gasterine useful in hypochlorhydria, whether neurasthenic or not. They found from 3 to 3.5 grammes of free hydrochloric acid to the thousand in gasterine. They consider that it acts principally by stimulating the pancreatic secretion. The ordinary dose is from 4 to 6 tablespoonfuls daily.

GEMS. The value of the gems produced in the United States in 1900 was \$233,170, as compared with \$185,770 in 1899. Among these may be mentioned: Diamonds, \$150; sapphires, \$75,000; rubies, \$3,000; garnets, \$500; Amazon stone, \$250; emeralds, \$4,000; beryl, \$11,000; quartz crystal, \$10,000; pyrope, \$1,000; turquoise, \$82,000. The imports of diamonds were valued at \$13,561,588, of which \$7,803,066 were unset and \$3,658,545 were rough or uncut. The following particulars are given by the United States Geological Survey, in the *Mineral Resources of the United States* for 1900: The locality of fine blue sapphires in Fergus county, Mont.,

continued to produce, and there was a development of fancy-colored sapphires in the same State. The turquoises, instead of being cut alone, were cut with the rock or matrix in which they occur, and the material sold under the name of "turquoise matrix." The same was done with the emeralds from western North Carolina, which were put on the market under the name of "emerald matrix." Purple garnets were found in Macon county, N. C., and a new locality was discovered for colored tourmalines in California. Two diamonds were found in Tennessee, one of them weighing 1 13-16 carats. Another was found in Indiana of $4\frac{3}{4}$ carats, and one in Shelby county, Ala., weighing $4\frac{1}{4}$ carats. The Boer war in South Africa, however, interfered with the DeBeers mines and stopped their yield for nearly six months. Aside from this, there has been a gradual falling off in the production of these mines for the last few years and a great advance in the price of diamonds a carat. Thus, in 1899 diamonds were sold at 29s. 7.2d., and in 1900 at 35s. 10.2d. The main rock shaft at the Kimberley mine is now down 2,133 feet, and the lowest working level is at 1,840 feet. A number of diamonds were obtained in 1900 from a point about 250 miles south of Bartica, in British Guiana. There was also an increase in the price of carbon diamonds (which are used to set in boring tools), due to a corner in the market on these materials and the interruption of the bort mining in the Transvaal. On this account their cost has risen from \$16 to \$75 a carat, and the expense of diamond drilling from \$1.50 to \$4 a foot. The year 1900 also saw the reopening of the Burma ruby mines, which followed the reorganization of the company operating the same. These mines produce at least one-half of the world's production of rubies.

O. A. Derby (*American Journal of Science*, January, 1901, fourth series, xi., p. 25) gives an account of the mode of occurrence of topaz near Ouro Preto, Brazil. He believes the topaz to be the original constituent of the metamorphosed and decomposed igneous rock in which it is found. According to G. F. Kunz (*Engineering and Mining Journal*), the domestic production and the exports and imports of precious stones in the United States were greater in 1901 than in any other year. W. H. Holmes (*American Anthropologist*, 2, No. 3, July to September, 1900, p. 405) describes the great obsidian mines in the State of Hidalgo, Mexico. These were operated in prehistoric times and furnished employment for the population of the entire southwestern part of this country.

GEOGRAPHICAL PROCESS. See AFRICA; ANTARCTIC EXPLORATION; ARCTIC EXPLORATION; HEDIN; SVEN.

GEOGRAPHICAL SOCIETY, NATIONAL, an organization formed in 1888 by the majority of the active contributors to geographical science assembled at the national capital, having for its object the increase and diffusion of geographical knowledge. The society presents the principal results of geographical exploration and research, and affords writers at Washington opportunities for the publication of information in other than technical reports. The society publishes the *National Geographic Magazine*, an illustrated monthly, and holds an annual course of lectures, which has come to be an important feature of the intellectual life of Washington. It has aided and encouraged various expeditions, and offered prizes for essays on designated appropriate subjects. In 1901 the membership of the society was 2,487. President, Dr. Alexander Graham Bell.

GEOGRAPHIC NAMES, U. S. BOARD ON, created by President Harrison in 1890, is comprised of 12 members, representing the various government departments, bureaus, etc., and is an authority on all questions concerning geographical names. In March, 1901, the board published a second edition of its *Second Annual Report*, which contains all its decisions down to that date. In May, 1900, a special report on Philippine names was issued, and later a dictionary of Alaskan names.

GEOLOGICAL SURVEYS. During the year 1901 a geological survey was started in the State of Texas, under the provisions of an act of the State legislature passed in March. The terms of this act permitted the making of a mineral survey of the lands belonging to the public schools, university, or asylums of the State of Texas. The new survey is under control of the board of regents of the University of Texas, and has begun work in a most active manner. It has already issued a report on the Beaumont oil district of Texas, and is at present engaged in an investigation of the newly developed mercury districts of the same State. During 1901 the U. S. Geological Survey issued portions of its *Twenty-first Annual Report*, and the volume on *Mineral Resources* for 1900. Among other geological reports may be mentioned: Iowa Geological Survey Report (vol. 12), containing county reports; that of the Maryland Geological Survey, with report on the Eocene deposits of that State; New Jersey Geological Survey Report for 1900, with various papers, especially one on the Portland cement deposits of New Jersey; Indiana Department of Geology and Natural Resources, *Twenty-fifth Annual Report*, de-

voted chiefly to the limestones used for cement manufacture and the marl deposits of that State; Arkansas Geological Survey, report on lead and zinc deposits; Wisconsin Geological Survey, *Bulletin on the Clay Deposits of Wisconsin*; Texas Geological Survey, *Bulletin on Beaumont Oil Fields*; New York State Museum, *Bulletin on Geology of Niagara Falls*; Minnesota Geological Survey, geological atlas to accompany final report.

GEOLOGY. At the meeting of the American Association for the Advancement of Science held in Denver in August, 1901, Professor T. C. Chamberlin presented a paper entitled *On Some Studies Relative to Primal Questions in Geology*, in which he expresses the opinion that the nebular hypothesis as formulated by Laplace is inadequate to explain some known phenomena in geology and astronomy, and is led by the consideration of the loss of mass and momentum to the conclusion that "some system may have resulted from a gaseous or nebular mass getting within the attraction of a solid body in such a way as to become torn asunder into separate fragments. Vortical motion would ensue in the different parts of the system and produce the planets. This line of investigation points to the formation of the planets by the slow aggregation and solidification of attenuated matter without the production of the extremely high temperatures which have heretofore been supposed inevitable." Bailey Willis, in a paper on *Individuals of Stratigraphic Classification*, in the *Journal of Geology* (vol. 9, p. 587), discusses the unit to be used in geologic mapping, and concludes that the lithologic characters should be first considered and mapped, but that this should be supplemented by a consideration of the faunal details of the formations plotted and their distribution in stages; for, as he points out, the lithologic characters cannot always be safely used as a basis of classification. J. E. Spurr, in the *Bulletin of the Geological Society of America*, states his belief that the basin ranges owe their external form to long-continued erosion of rocks, which have been folded and faulted by a number of movements, and that it is only in rare cases that the present topography is a direct expression of folding and faulting. G. F. Becker, in a *Report of the Geology of the Philippine Islands* (21st Annual Report, U. S. Geological Survey), gives a résumé of what is known regarding the geology of these islands, and also adds some observations of his own. The following may be mentioned among the papers which have been published during the past year: A. W. Grabau, *Guide to the Geology and Paleontology of Niagara Falls and Vicinity* (*Bulletin* New York State Museum, vol. 9, No. 45, p. 234); L. F. Ward, *Geology of the Little Colorado Valley* (*American Journal of Science*, 4th series, No. 12, p. 401); W. B. Clark and G. C. Martin, *The Eocene Deposits of Maryland* (vol. on Eocene, Maryland Geol. Survey, 1901); C. N. Gould, *Notes on the Geology of Parts of the Seminole, Creek, Cherokee, and Osage Nations* (*American Journal of Science*, 4th series, No. 11, p. 185); *Outline of the Geology of Japan* (published by the Geol. Survey of Japan, Tokio, 1900); G. M. Dawson, *Geological Report on the Rocky Mountains Region in Canada* (*Bulletin of the Geological Society of America*, No. 12, p. 57); S. Weller and H. B. Kummel, *Paleozoic Limestone of the Kittatinny Valley, New Jersey* (*Bulletin of the Geological Society of America*, No. 12, p. 147).

Vertebrate Paleontology.—G. W. Andrews (*Extinct Egyptian Vertebrates*, *Geological Magazine*, p. 400, 1901) describes the discovery of a number of interesting types in the western desert of Egypt. It is claimed that the importance of these discoveries is that they will show that Africa was the home of many families of mammals, such as elephants, hippopotami, giraffes, etc., which suddenly appeared in Europe without known ancestry. H. F. Osborn, in a paper entitled *Reconsideration of the Evidence for the Dinosaur-avian Stem of the Permian* (*American Naturalist*, No. 34, p. 777), discusses evidence bearing on this point. The same author, in a paper on the *Phylogeny of the Rhinoceroses of Europe* (*Bulletin* American Museum Natural History, vol. 13, art. 19, p. 220), divides the rhinocerotidæ into six phyla, having no known relation to each other, and traceable back to their stem forms in the early Cenozoic. Lucas reports the finding, in the Triassic of Arizona, of belodont and dinosaur bones; also fragments of a very large labyrinthodont. Among the other discoveries may be mentioned one by C. H. Sternberg of a fine skeleton of a new plesiosaur in the Kansas chalk, and another skeleton 16 feet long of *Portheus*, a predaceous fish. The paleontological expedition sent out by the Field Columbian Museum (Chicago) has found a number of dinosaur bones which belong probably to an animal of this family larger than any other known. One of the ribs measured more than 9 feet in length, while the femur is 80 inches long, which is 6 inches longer than that of Marsh's *Atlantosaurus*. J. S. Kingsley presents a paper on the *Origin of Mammals in Science* (N. S., August 9, 1901).

Paleontology.—G. Lindström, in a paper on the *Researches on the Visual Organs of the Trilobites*, points out that many species are lacking in eyes which were considered to have them, and announces that he has found true eyes on the hypostomes of many species. C. E. Beecher, in a paper on the *Discovery of Eurypterid Remains*

in the Cambrian of Missouri (*American Journal of Science*, 4th series, No. 12, p. 365), in announcing the discovery of a new genus from this formation, extends the known range in time of these crustaceans. Until recently the eurypterids have hitherto been confined almost exclusively to the Waterlime rock, but recently J. M. Clarke has also found them at the base of the Salina. Among other paleontological papers which have been recently published may be mentioned the following: F. Huehne, *Beiträge zur Beurtheilung der Brachiopoden* (Centralblatt für Mineralogie, 1901).

Petrography.—Weed and Pirsson have examined a very interesting group of laccoliths in the Highwood Mountains of Montana (*Geology of the Shonkin Sag Palisade Butte, Laccoliths in the Highwood Mountains of Montana, American Journal of Science*, 4th series, vol. 12, p. 1). It was found by these investigators that during intrusion there was a curious concentration and differentiation in the magma, so that the laccoliths are made up of shells of different rock types. A. A. Julien, in a paper on the *Study of Structure of Fulgurites* (*Journal of Geology*, No. 9, p. 673), shows that considerable variation appears in these structures, and that this difference is probably due to variations in the volume, intensity, and duration of the electric currents which pass through the rock. H. S. Washington finds, in studying Glaucophane schists from different localities (*A Chemical Study of the Glaucophane Schists, American Journal of Science*, 4th series, vol. 11, p. 35), that they belong to a basic or main group and an acid group which is of secondary importance. Among the other papers on petrography which have been issued during 1901 may be mentioned: J. E. Spurr, *Variations in the Texture of Certain Tertiary Igneous Rocks of the Great Basin* (*Journal of Geology*, vol. 9, p. 587); W. O. Crosby, *Geology of the Boston Basin* (vol. 1, part 3), Boston Society Natural History, *Occasional Papers* (iv., 289-694); W. G. Miller, on *Some Newly Discovered Areas of Nepheline Syenite of Central Canada* (*American Geologist*, vol. 27, p. 21); T. L. Watson, *Granitic Rocks of Georgia and their Relationships* (*American Geologist*, No. 27, p. 199); A. N. Winchell, *Study of the Gabbroid Rocks of Minnesota* (*American Geologist*, 1901); E. Ordenez, *The Rhyolites of Mexico*, 1st part (*Bulletin of the Mexico Geol. Institute*, No. 4, p. 175). This is the first part of the detailed study of the Mexican volcanic rocks.

•**Physical Geology.**—O. Fischer, in a paper on *The Rival Theories of Cosmology* (*American Journal of Science*, 4th series, vol. 11, p. 414), compares the nebular hypothesis of the origin of the earth and the accretionary theory recently advanced by Chamberlin. Hill believes that the Texas coastal plain from the Trinity River to the mouth of the Colorado is rising. The effect of this is to form very slight valleys or wrinkles in the strata of this area. One of these is Danon's Mound in Brazoria County, which Hill believes to have a quaquaversal dip. Fairchild points out that the Medina sandstone is a shallow-water deposit, and certain structures found in it are not giant ripples formed in the deep ocean, as put forth by Gilbert in the *Bulletin of the Geological Society of America*. Shattuck, in studying the coastal plain of America (*The Pleistocene Problem of the North Atlantic Coastal Plain, American Geologist*, No. 28, p. 87), finds that there are five different shore lines representing different levels of the ocean during an earlier depression of the coastal region, and that these are accompanied by wave-cut and wave-built terraces, bars, etc.; the uppermost terrace is 300-500 feet above the present sea level, while the lowest is the present shore line. J. E. Tallmadge (*Science*, new series, vol. 13, p. 550) records the occurrence of a recent movement along a minor fault plane at the mouth of Ogden Canyon, Utah. A crack was opened in the mass of gneiss, through which a water-power tunnel had been cut, fracturing the walls of the tunnel and allowing the water to escape on the mountain side at depths of 50 to 150 feet below the tunnel floor. During the retreat of the ice sheet from the Lake Superior and Red River districts, a number of glacial lakes were formed. N. H. Winchell, in the *Bulletin of the Geological Society of America*, has described 26 of these from Minnesota. Lake Agassiz is the best known, and was much larger than any of the others. H. Arctowski, in an account of the Antarctic voyage of the Belgica, during 1897-99, shows that in Tierra del Fuego, there are well-marked traces of the former extension of glaciers. Moraines were seen at various points along Belgica Strait, between Dando Land and outlying islands. One of these, at Cape Reclus, indicated a former mer-de-glacé ten miles wide and 342 fathoms deep. An immense glacier must also have flowed westward through Belgica Strait toward the Pacific Ocean. (*Journal of Geology*, vol. 17, No. 353.) Glacial geologists have often sought in the eastern States for good evidence of the existence of more than one advance of the ice during the glacial period, and during the past year M. Fuller has found evidences of the older till underlying one of later age in the region around Dedham, south of Boston. (*Probable Representatives of Upper Wisconsin Till in Southeastern Massachusetts, Journal of Geology*, vol. 9, p. 311.) Among other papers in physical geology may be mentioned: W. H. Hobbs, *The River System of Connecti-*

cut (Journal of Geology, September to October, 1901); W. T. Smith, *A Topographic Study of the Islands of Southern California* (Bulletin, Department of Geology, University of California, Vol. 2, p. 179); R. A. Daly, *The Physiography of Acadia* (Bulletin, Museum of Comparative Zoology, xxxviii., Geology Series, Vol. 5, No. 5, p. 73). The following books on geology appeared during 1901: Sir A. Geikie, *The Founders of Geology*, Baltimore; A. P. Brigham, *A Text-book of Geology*, New York; H. G. Seeley, *Dragons of the Air: An Account of Extinct Flying Reptiles*, London; G. H. Barton, *Outline of Elementary Lithology*, Boston; C. R. Dryer, *Lessons in Physical Geography*, New York; R. E. Dodge, *A Reader in Physical Geography*, New York; G. Walther, *Das Gesetz der Wustenbildung in Gegenwart und Vorzeit*.

GEORGETOWN UNIVERSITY, a Jesuit institution, Washington, D. C., founded 1789, consists of the college, school of medicine (which, beginning 1901, includes a school of dental surgery), and school of law. In 1901 the faculty consisted of 109 professors and instructors, and the student-body of 546, deducting 19 duplicated, matriculated, as follows: College, 166, of whom 142 were undergraduates and 24 graduates; medical, 123; law, 276. Connected with the university is the Georgetown Preparatory School, which prepares students for the college. Their class rooms are situated in the main building of the college, but the students are kept apart from the college men and their dormitories, study hall, play-ground, etc., are entirely separate. A site has already been secured, and it is hoped that the preparatory school will soon possess a building of its own. The system of discipline is one of the features of the university. The college is considered a large family. The professors live with the students, mingle with them constantly, and personally direct their studies. The chief needs are a gymnasium and swimming pool; the completion of the equipment of the observatory; endowments for scholarships, and liquidation of the debt of the university free hospital.

GEORGIA, a southeastern State of the United States, has an area of 59,475 square miles. The capital is Atlanta. Georgia is one of the original thirteen States. The population in 1900 was 2,216,331, while in June, 1901, as estimated by the government actuary, it was 2,258,000. The populations of the three larger cities in 1900 were: Atlanta, 89,872; Savannah, 54,244, and Augusta, 39,441.

Finances.—At the beginning of the fiscal year ended September 30, 1901, the balance in the treasury was \$416,146.30. The receipts during the year 1900-1901 were \$3,804,195.73, making a total of \$4,220,342.03. Expenditures during the year amounted to \$3,489,619.93, leaving a balance on hand October 1, 1901, of \$730,722.10. The total State debt on the same date was \$7,826,202, of which \$7,736,000 was bonded. The difference (\$90,202) is known as the "land script fund," on which the State pays the university trustees annually 7 per cent. interest. A novelty for Georgia was the placing of a loan of \$200,000 with State banks only. It was obtained at the lowest rate of interest ever paid by this or any other State—2 per cent.

Industries.—Although Georgia is an agricultural State, there has been a rapid growth in its manufacturing and mechanical industries during the last half century, and especially during the last decade. It appears from the census returns that while from 1850 to 1900 the population increased from 906,185 to 2,216,331, or 144.6 per cent., the average number of industrial employees during the same period increased from 8,368 to 83,842, or 901.9 per cent. In 1850 the gross value of manufactured products was \$7,082,075; in 1890 it was \$68,917,020, and in 1900 it was \$106,645,527. If from the gross value of all manufactured products is subtracted the value of those re-used in manufacture, the true net value of products manufactured in Georgia in 1900 is found to be \$78,154,611. At the same time the amount of money invested in manufacturing industries, exclusive of capital stock, was \$89,789,656, 7,504 establishments reporting. As cotton is the principal crop of the State, so manufactures depending on it have the greatest value, aggregating \$26,609,022 in 1900. Of this total the cotton goods industry gave \$18,544,910, and the manufacture of cottonseed oil and cake, \$8,064,112. Products from the extensive pine forests of Georgia rank next in value to the cotton manufactures, having in 1900 a value of \$21,815,391, including rosin and turpentine products. By a proper system of forest preservation it is stated that this industry might be largely increased in value. But the destructive methods employed would seem to destine it to early extinction. Of other industries, may be mentioned flour and grist milling, whose products were valued in 1900 at \$8,330,439, as against \$5,190,311 in 1890; planing manufactures, valued at \$4,302,976; foundry and machine shop products, valued at \$3,506,427; railroad repairing and construction, valued at \$3,062,283, and the manufacture of fertilizers, valued at \$3,367,353. Atlanta, Augusta, Macon, and Savannah are the leading manufacturing cities. Atlanta, holding first place, increased the value of her products during the decade by 27.9 per cent., having in 1900 a production valued at \$16,721,899.

State Officers.—Governor, Allen D. Chandler, Democrat, elected for two years, term expires November 1, 1902; secretary of state, Philip Cook; comptroller, William A. Wright; treasurer, Robert E. Park; attorney-general, J. M. Terrell; adjutant-general, P. G. Bird; commissioner of agriculture, O. B. Stevens; superintendent of education, G. R. Glenn; insurance commissioner, W. A. Wright; chief justice of the Supreme Court, Thomas J. Simmons, term six years, expires in October 1904; associate justices, Samuel Lumpkin, Henry T. Lewis, Andrew J. Cobb, William A. Little, and William H. Fish—all Democrats.

Congressional Representatives (57th Congress).—In the House: Rufus E. Lester, of Savannah; James M. Griggs, of Dawson; Elijah B. Lewis, of Montezuma; William C. Adamson, of Carrollton; Leonidas F. Livingston, of Kings; Charles L. Bartlett, of Macon; John W. Maddox, of Rome; William M. Howard, of Lexington; Farish C. Tate, of Jasper; William H. Fleming, of Augusta; William G. Brantley, of Brunswick—all Democrats. In the Senate: Alexander S. Clay (until 1903), of Marietta, and Augustus O. Bacon (until 1907), of Macon—both Democrats.

GERMAN BAPTISTS. See DUNKARDS.

GERMAN EAST AFRICA. See EAST AFRICA, GERMAN.

GERMAN EVANGELICAL SYNOD OF NORTH AMERICA, organized in 1840, a result of a union of Lutheran and Reformed elements, is a type of the State Church of Prussia. It has (1901) in its 17 districts, 203,281 members, with 922 ministers and 1,153 churches; and 964 Sunday schools, with 10,202 officers and teachers and 100,649 scholars. The church numbers among its activities a progressive educational work; home missions, a feature of this department being an emigrant and harbor mission in Baltimore, Md.; foreign missionary work, including, in India, 4 stations and 8 missionaries; and a publishing house at St. Louis, Mo. The report of the treasurer of the synod shows for the years 1899-1901 total receipts of \$205,485 and expenditures of \$182,101, the balance, when applied to the existing debt, leaving one of only about \$16,500. Besides this account, to the specialized departments of work certain sums were devoted. These include about \$75,000 for educational work, \$36,000 for charitable enterprises, \$45,000 for home missions, and nearly \$60,000 for foreign missions. Officers of the German Evangelical Synod: President, Rev. J. Pister; secretary, Rev. E. Fuhrmann, 404 Lafayette Street, Newark, N. J.; treasurer, Rev. L. Kohlmann.

GERMAN LITERATURE. *History and Biography.*—As a general rule, the historical works which emanate from Germany share to so large an extent the ponderous dullness of their legal, theological, or scientific treatise, and possess so little of that vital quality which makes a volume readable, that it is difficult to decide just where the line should be drawn in a survey of the year's progress in literature. It is at least clear that the works of this class stand too far outside of the current literary movement to be significant, in the sense that the new fiction and drama are significant, of the prevailing intellectual tendencies in literature. Now and then, however, we find a historian who plainly seeks to combine a high degree of scholarship with a style which shall be attractive to the general public. A good example of this is Otto Seeck's *Geschichte des Untergangs der antiken Welt*, the second volume of which has just appeared, after an interval of four years. The distinguishing attitude of the work is its tendency to disparage Hellenism and to hold that the only products of that period which had enduring worth were the outcome of the Semitic spirit. An interesting contrast in more ways than one is offered by a comprehensive work by Julius Kaerst, *Geschichte des Hellenistischen Zeitalters*, the first volume of which has recently appeared. Of documentary history, *Quellen, Forschungen, and Untersuchungen*, issued from official sources or published by the various historical societies, there seems to be no end. There appeared in 1901, among others, the third volume of *Quellen zur Geschichte des Hauses Hohenzollern*; the fourth volume of *Quellen zur Geschichte der Stadt Wien*; Vol. VIII. of the *Quellen zur Geschichte, Litteratur und Sprache Oesterreichs und seiner Kronländer*; Vol. XX of the *Quellen zur Schweizer Geschichte*, and other similar series too numerous to chronicle. Of a somewhat analogous character is the history of *Die Kriege Friedrichs des Grossen*, the latest volumes of which cover the Seven Years' War. Of mingled historical and biographical interest are *Kaiser Friedrichs Tagebücher*, edited by M. von Poschinger, and covering the wars of 1866 and 1870-71, and the emperor's travels in the East and in Spain. Another volume of war-time memoirs of considerable importance bears the title, *Im Hauptquartier der II. Armee, 1866*, and is written by the Prussian general, Julius von Verdy du Vernois, who is well qualified to speak with authority, since he took an active part in all the campaigns from 1863 to 1871, with the exception of 1864, and was one of the principal writers of the authoritative *Geschichte des Kriegs von 1866* and other government publications.

Among biographical works, Bismarck literature still holds a prominent place. The well-known *Gedanken und Erinnerungen* have been augmented by two supplementary volumes, containing in all upward of 1,000 pages, the first dealing with the

relations between the Emperor William I. and Bismarck, the second containing selections from the latter's correspondence. *Fürst Bismarck und der Bundesrat*, by Heinrich von Poschinger, has at last been completed by the appearance of the fifth volume, which covers the years 1881-1900. Still another work which deserves emphasis is *Fürst und Fürstin Bismarck*, by the veteran statesman, Robert von Keudell, who for many years was closely associated with the chancellor, both politically and socially, and who here adds to his title-page the explanatory sub-title, "Recollections of the years 1846 to 1872."

Biographies of a literary and critical interest include a serious study of Mme. de Staël, by Mathias Friedwagner. While recognizing her intellectual strength, this biographer holds that on the whole the author of *Corinne* has been too far exalted, and that to a large extent she shone in the reflected light of her predecessors, who have been unjustly forgotten. Richard Ackermann is the author of a brief but suggestive monograph upon Lord Byron, *Sein Leben, seine Werke, sein Einfluss auf die Deutsche Litteratur*. Benno Diederich, who has already proved his intelligent appreciation of the French realists in a brief but clever sketch of Zola, has recently published *Alfonse Daudet, sein Leben und seine Werke*, which is receiving cordial praise for its impartial treatment of the author of *Sapho*. A notable contribution to literary autobiography is *Jugenderinnerungen und Bekenntnisse*, by the veteran novelist, Paul Heyse. There is a pervading tone of melancholy in these memoirs, which clearly betray the author's chagrin that the public has failed to appreciate his efforts as a dramatist to the same degree that they have his works of fiction.

Fiction.—Among the older generation of novelists, none is better known than Friedrich Spielhagen and Marie von Ebner-Eschenbach, each of whom has published a volume of uncommon significance. *Freiebornen* is the title of Spielhagen's novel, a sombre, gloomy tale of an unhappy woman's life, from her school days to the loneliness of a convent, through irksome years as companion in a Jewish family, down to the disillusion of an unfortunate marriage, and her final fate as a confirmed invalid. Nevertheless, this "freeborn lady," in spite of her bitter experiences, ends by finding a philosophy of life, and works out for herself the freedom of soul for which she has so long striven. Marie von Ebner-Eschenbach's new volume is not a novel, but a collection of short stories, *Aus Spätherbsttagen*, all of which have this in common with Spielhagen's romance, that they deal primarily with the sorrows and sufferings of women. Typical of the volume is the brief but powerful sketch called "Maslan's Wife," depicting a much-wronged woman who has repeatedly pardoned her faithless husband up to the day when her patience is tried beyond endurance. And then she takes an oath never again to seek him out unless expressly summoned by him—an oath that she keeps even when he is on his death-bed. In similar vein is "To be Burned Unopened," which also deals with a husband who is openly unfaithful, regarding infidelity as a prerogative of his sex. But when, in the course of time, the wronged wife dies and he finds among her papers a packet of letters "to be burnt unopened," he obeys the instruction, but, judging her by his own standard, is seized by a doubt of her loyalty, and thus is led into killing his best friend before his eyes are opened to the truth. Another story which has attracted some attention is *Die Geschichte der jungen Renate Fuchs*, by Jacob Wassermann. The general tone of this book is strongly symbolic, and the central thesis is that a young woman may pass through a series of trying vicissitudes and improbable adventures, and yet preserve her original honesty and purity of thought. Two North German novelists, whose names have hitherto been identified with the realistic school, Wilhelm von Polenz and Georg von Omteda, both show a tendency in their latest volumes to devote themselves more and more to depicting the inner life of the soul. Omteda's new stories are *Monte Carlo* and *Cäcilie von Sarryn*, forming a continuation of his history of a "Deutscher Adel um 1900," begun last year by his much-praised *Eysen*. Von Polenz's new story, *Liebe ist ewig*, though full of psychological interest, is criticised for its vagueness. Another writer who has earned a fair degree of recognition is Clara Viebig, whose latest volumes are a collection of short sketches, called *Die Rosenkranzjungfer*, and a novel, *Das tägliche Brot*, depicting the fate of two servant girls who come to Berlin and there seek employment. Among the younger generation of writers who have lately sprung up in Vienna, Arthur Schnitzler is the one who has best proved his claim to be a leader. Since he first came into notice five or six years ago with a volume of powerful sketches called *Sterben*, his most decided successes have been won in the field of the drama, his latest achievement in that line being *Das Verächtniss*, in which the sudden death of a dissipated young army officer reveals to his family the existence of an illegitimate child, and forces upon them the problem of determining what shall be the status of that child's mother. Schnitzler's latest novel, *Frau Bertha Garlan*, is strongly psychological. It is a study of a young widow's gradual reawakening to the demands of the senses, her yielding to temptation, and her subsequent remorse. Other novels of the year which deserve at last a cursory mention are: *Ma*, by Lou

Andreas-Salome, dealing with the tragedy of a mother's renunciation; *Eine Schuld*, by Wilhelm Jensen, the chief charm of which, as in his earlier novels, lies in the beauty of his descriptions of nature and scenery; *Die Overbecks Mädchen*, by Max Grad, a study of twin sisters, who have respectively the qualities of a Martha and a Mary; and lastly, a volume of characteristic sketches by Paul Heyse, entitled *Ninon und Andere*.

GERMAN METHODIST CHURCH. See EVANGELICAL ASSOCIATION.

GERMAN REFORMED CHURCH. See REFORMED CHURCH IN THE UNITED STATES.

GERMAN SOUTHWEST AFRICA, a German protectorate with an Atlantic coast line of 930 miles, interrupted, however, about in the middle by Walfisch Bay, a British possession comprising about 430 square miles. German Southwest Africa is bounded on the north by Angola and on the east and south by British possessions. The estimated area is 322,450 square miles, and the population is estimated at about 200,000. On January 1, 1900, there were 3,388 white persons in the colony, of whom 2,146 were men. Of these men 1,658 were Germans, 128 were English, and 801, of whom 799 were Germans, were connected with the army; there were 150 merchants (139 German), 41 clergymen and missionaries, 422 planters, and 674 laborers. The colony is administered by an imperial commissioner stationed at Windhoek, 180 miles inland from Walfisch Bay. There is a local police force in the principal towns. The coast lands and the southern part of the protectorate are barren, and although large areas of the interior are fit for cultivation, the region is by no means productive. The budget for 1900 balanced at 10,727,000 marks, of which 9,378,000 marks were contributed by Germany. (The mark is worth 23.8 cents.) The exports in 1899 were 1,399,478 marks, of which the main items were guano, valued at 1,095,000 marks, and live-stock, valued at 120,200 marks. Ostrich feathers also form an important part of the exports. The imports in 1899 were valued at 8,941,154 marks, consisting of canned goods, iron, building materials, textiles, tobacco, liquors, beer, and coffee. Of these commodities, by far the greater part came from Germany. Communication with the coast is difficult, and therefore the chief route of trade from the interior is over the mountains to Cape Town.

The government is doing its utmost to develop this territory. It has given concessions to the German Colonial Company for Southwest Africa; and in Damara-land the Southwest African Company has a mining concession. There are eleven companies formed to induce colonists to settle, for the development of mineral resources or other industries. It is reported that both gold and copper exist in paying quantities, but the facilities of transportation from the mines to the coast are so meagre that little attempt has been made at exploitation. In the neighborhood of Bersaba, the German Mining Syndicate has found diamonds, and a great marble quarry has been discovered between Otjimbingue and Ubib. This stone is said to be as fine as that of Carrara. The rinderpest, which has depleted the herds of cattle ever since 1897, is apparently yielding to treatment with Koch's lymph. Sheep, Angora goats, camels, and swine are raised with some success. The government has improved the roads from the coast to the interior, and over the pass of the Auas Mountains, which had been impracticable for freight wagons, a road six metres wide has been built. The roads along the coast have been improved, and a great highway from Luderitzbucht to Keetmanshoof is being laid out. The railway, the route of which has been surveyed from Swakopmund through several important towns to the capital city, Windhoek, was on July 1, 1901, in operation as far as Karibib, 112 miles from the coast terminal. At this terminal, the harbor has been improved and is said to be almost as commodious as that of Walfisch Bay. Swakopmund is connected by cable with Cape Town, and a telegraph line follows the railway inland. There are post-offices at Windhoek, Keetmanshoof, Otjimbingue, and Swakopmund, together with 24 subordinate postal agencies.

GERMANY, a European empire consisting of twenty-five states and the imperial provinces of Alsace and Lorraine. The capital is Berlin.

Area and Population.—The total area of Germany is 208,830 square miles, and the population, according to the census of December 1, 1900, 56,345,014. The table on the next page shows the states comprising the empire, their area, their population on December 1, 1890, on December 2, 1895, and on December 1, 1900, and the percentage of increase between the last two dates.

According to the last census there were 27,731,067 males and 28,613,947 females. The density of population in 1895 was 250.5 to the square mile, and in 1900, 269.3. The population of the territory now included in the empire (without Heligoland) was 24,831,396 in 1816, 31,589,547 in 1837, 41,058,792 in 1871, and 45,234,061 in 1880. In 1900 the populations of cities with over 200,000 inhabitants were as follows: Berlin, 1,884,151; Hamburg, 705,738; Munich, 499,959; Leipzig, 455,089; Breslau, 422,738; Dresden, 395,349; Cologne, 372,229; Frankfort-on-Main, 288,489; Nurem-

States.	Area Square Miles.	Population Dec. 1, 1890.	Population Dec. 2, 1895.	Population Dec. 1, 1900.	In- crease per ct.
Kingdoms:					
Prussia.....	134,603	29,967,367	31,855,123	34,463,377	8.19
Bavaria.....	29,282	5,594,982	5,818,544	6,175,153	6.13
Saxony.....	5,787	3,502,684	3,787,688	4,199,788	10.88
Wurtemberg.....	7,628	2,086,522	2,081,151	2,165,765	4.67
Grand Duchies:					
Baden.....	5,821	1,657,867	1,725,464	2,165,765	8.18
Hesse.....	2,965	992,883	1,089,020	1,120,426	7.83
Mecklenburg-Schwerin.....	5,136	578,342	597,436	607,835	1.74
Saxe-Weimar.....	1,388	326,091	339,217	362,018	6.73
Mecklenburg-Strelitz.....	1,131	97,978	101,540	102,628	1.07
Oldenburg.....	2,479	354,968	373,739	398,499	6.82
Duchies:					
Brunswick.....	1,424	408,773	434,213	464,261	6.92
Saxe-Meiningen.....	953	223,892	234,006	250,893	7.13
Saxe-Altenburg.....	511	170,864	180,313	194,273	7.74
Saxe-Coburg-Gotha.....	765	206,513	216,603	222,567	5.99
Anhalt.....	906	271,963	293,298	316,027	7.75
Principalities:					
Schwarzburg-Sonderhausen.....	333	75,510	78,074	80,878	3.34
Schwarzburg-Rudolstadt.....	363	86,863	88,886	92,667	4.48
Waldeck.....	433	87,281	87,766	97,913	0.26
Reuss Elder Branch.....	122	62,754	67,468	68,287	1.31
Reuss Junior Branch.....	319	119,811	132,130	138,993	5.19
Schaumburg-Lippe.....	131	39,163	41,224	43,132	4.63
Lippe.....	469	128,496	134,654	139,338	3.26
Free Towns:					
Lubeck.....	115	76,485	83,324	96,775	16.14
Bremen.....	99	180,443	196,404	224,697	14.41
Hamburg.....	168	662,530	681,632	768,349	12.72
Imperial Provinces of Alsace and Lorraine.....	5,600	1,603,506	1,640,968	1,717,451	4.66
Total.....	208,830	49,428,470	52,279,901	56,345,014	7.78

burg, 261,022; Hanover, 235,666; Magdeburg, 229,663; Düsseldorf, 213,767; Stettin, 210,680; Chemnitz, 206,584. In 1901 there was a very noticeable increase in the number of emigrants from Germany. There was an increased emigration to Argentina and Uruguay but a decline in that to Brazil.

Government.—The chief executive authority rests with the emperor, William II., of the House of Hohenzollern, who is also king of Prussia; he was enthroned in 1888. The heir apparent is Prince Frederick William, who was born in 1882. The first minister of the empire is the imperial chancellor, who has charge of the department of foreign affairs; he is appointed by the emperor and, unlike the other ministers, is responsible to the imperial legislature. This is a bicameral body consisting of an upper house, or *Bundesrath*, the members (58) of which represent the individual German states, and a lower house, or *Reichstag*, whose members (397) represent, and are elected by, the people. The emperor convokes these bodies annually and has no veto on the laws enacted by them. The imperial chancellor (and president of the Prussian ministry) since October, 1900, has been Count Bernard von Bülow.

Army and Navy.—All Germans capable of bearing arms are liable to service in the army or navy for at least six years. Pursuant to the law of 1899 the peace strength of the imperial army in 1903 will be 495,000. The army on a peace footing in 1900 numbered 23,850 officers and 576,666 men. The infantry comprised 13,314 officers and 386,865 men, and the cavalry, exclusive of about 800 in special service, 2,406 officers and 66,229 men. The estimated strength of the German army on a war footing is over 3,000,000 trained men.

A law dated June 14, 1900, provides that by 1916 the navy, exclusive of torpedo boats, special service vessels, gunboats, and training ships, shall comprise 34 battleships, 11 large and 34 small cruisers and, as a reserve, 4 battleships and 3 large and 4 small cruisers. It seems not unlikely that the new navy will be completed before 1916. All of the new battleships excepting one will be laid down by 1905 and all the new cruisers by 1909; after the latter date, accordingly, the construction will be merely to replace older vessels. Exclusive of transports and old and non-effective vessels, the navy in February, 1901, consisted of 1 first-class battleship (and 6 building), 10 second-class battleships, 1 armored cruiser, 8 third-class battleships (and 1 building), 19 coast defense vessels, 15 protected cruisers, 8 torpedo gunboats, 11 destroyers (and 8 building), 35 first-class torpedo boats, and 103 second and third class torpedo boats. There were laid down in 1901 2 battleships of 13,000 tons; 1 armored cruiser of 8,870 tons, to replace the *König Wilhelm*; 3 small cruisers of 2,800

tons, and 6 destroyers of 350 tons. The new battleships will have 15,000 indicated horse-power and a speed of about 19.5 knots. The naval complement for 1900-01 consisted of 1,305 officers, 24,727 petty officers and seamen, and about 2,300 others. The enthusiasm that for a number of years has led the emperor and his ministers to strive for the construction of a navy commensurate in strength with the German army has, it appears, taken possession of the German people; excepting, of course, the Socialists and Agrarians. The naval budget for the fiscal year 1901 was 196,734,172 marks (\$46,822,733), of which 74,983,000 marks (\$17,845,954) were devoted to ship-building and 25,003,000 marks (\$6,093,514) to armament. This budget provided for the construction of new vessels, the conversion of the coast-defense vessels of the old *Siegfried* type into sea-going warships, the building of arsenals, the increasing of armament, and the laying of submarine cables. The supplementary budget for the Chinese expedition of 1900-01 contained appropriations for the establishment of a naval base at Kiao-Chau. The reported estimates adopted by the federal council for 1902 amounted to 209,000,000 marks (\$49,742,000), a decrease of 3,400,000 marks (\$809,200) from the amount named in the Navy Bill for 1902.

Finance.—The monetary standard is gold and the unit of value is the mark, worth 23.8 cents in United States money. The imperial revenue is derived mainly from customs duties, excise, posts, telegraphs, stamps, and state railways. Deficits are made up by assessments on the several states, levied in proportion to population. The largest imperial expenditures are for the departments of war and finance; according to the budget for the year ending March 31, 1901, the expenditure for the former amounted to 541,758,000 marks and for the latter 520,295,000 marks. The total revenue and expenditure, according to the budget estimates, have been as follows for fiscal years ending March 31: 1900, revenue, 1,921,062,000 marks and expenditure, 1,946,583,000 marks; 1901, revenue, 2,025,770,000 marks, and expenditure, 2,056,497,000 marks; 1902, the revenue and expenditure balance at 2,354,121,046 marks. For the last year the largest items of estimated revenue were, in marks: Customs and excise, 810,330,850; federal contributions, 570,933,000; posts and telegraphs, 420,162,950; stamps, 114,020,000; railways, 93,676,000. Similar figures for estimated expenditure were: Imperial army, 673,124,600; imperial treasury, 578,296,260; posts and telegraphs, 382,394,633; navy, 207,484,172; imperial debt, 88,967,500; pension fund, 70,994,638. The reported amount of the total funded debt at the end of March, 1899, was 2,222,950,700 marks; the unfunded debt, represented by imperial treasury bills, on the same date amounted to 120,000,000 marks. In September, 1900, a new loan was issued for 80,000,000 marks, and in March, 1901, the government arranged for still another loan of 300,000,000 marks.

Industries.—Formerly Germany was a distinctively agricultural country; cultivation, both extensive and intensive, almost reached its limit. A reaction set in and large numbers of the working classes left the farms for the factories. This movement is clearly seen in the returns of the last census, which show a remarkable increase in the urban population. The farm lands now actually suffer from a lack of laborers, and as a result the Agrarian party has increased its efforts toward the enactment of higher tariffs on agricultural products. On the other hand the rapid development of German manufactures received a check in 1901, when the economic situation, both agricultural and industrial, was inauspicious.

The following figures are the official returns in metric tons (2,204.6 pounds) for some of the principal German crops in 1899 and 1900:

Crop.	1899.	1900.	Crop.	1899.	1900.
Potatoes	38,486,202	40,585,317	Oats	6,882,687	7,091,930
Hay	23,767,790	23,116,276	Wheat	3,847,447	3,841,165
Rye	8,675,792	8,550,659	Barley	2,983,876	3,002,182
Clover	8,277,273	6,781,284	Alfalfa	1,351,104	1,316,441

The average yield a hectare (2.471 acres) in 1900 of wheat, barley, oats, potatoes, and hay slightly exceeded the mean annual average for the preceding eight years, while the average of clover and alfalfa was considerably below the mean average. Estimates in tons for 1901 were: Rye, 8,145,500; oats, 7,105,000; wheat, 2,470,000; barley, 3,021,860. The estimated import of wheat in the latter year was 3,000,000 tons and of rye 1,000,000 tons. The falling off in the wheat and rye crops in 1901 led to serious discussions concerning the food supply of the empire, and in order to avoid threatened disaster, a memorial was addressed to Count von Bülow, minister-president of Prussia, asking that the government adopt certain measures of relief. Among these proposed measures were loans at a low rate of interest to farmers, a reduction of freight rates on agricultural produce, and the postponement of the payment of agricultural rents. These conditions led the Agrarians to demand higher tariffs on agricultural products, while to all others the same conditions obviously suggested lower tariffs. The live-stock in Germany on December 1, 1900,

numbered 4,180,000 horses, 19,011,631 cattle, 16,693,135 swine, 9,682,262 sheep, 3,207,688 goats.

It was generally recognized in 1901 that a crisis in the beet sugar industry was impending in central Europe. The sugar production of Germany, Austria-Hungary, France, and Russia has continued to increase and in Germany far exceeds the local consumption. In that country the short grain crops of 1901 indicated a reduction in the purchasing capacity of the poorer classes, so that it was thought the consumption of sugar would decline by 75,000 tons in the fiscal year 1902. The prospects of the German sugar industry are rendered still worse by the threatening competition of Cuban sugar in the United States, as well as by the rapid increase of the beet sugar industry in that country.

The following figures compare in estimated amount and value the principal minerals raised in 1898 and 1899:

	1898.		1899.	
	Metric tons.	Marks.	Metric tons.	Marks.
Coal	96,309,652	710,233,000	101,639,753	789,449,000
Lignite	31,648,898	73,380,000	34,204,666	78,450,000
Iron ore	10,552,312	49,678,000	11,975,241	57,180,000
Zinc ore	641,706	22,047,000	664,536	35,420,000
Kainite and other potassium minerals	2,208,855	29,651,000	2,493,131	32,161,000
Copper ore	702,781	19,685,000	733,619	20,868,000
Lead ore	149,311	13,113,000	144,370	14,112,000
Rock salt	807,792	3,389,000	861,123	3,828,000

The total reported value of foundry products in 1898 was about 541,500,000 marks and in 1899 about 656,500,000 marks. In the latter year the values in marks of the most important foundry products were as follows: Pig iron, 411,300,000; zinc, 73,000,000; copper, 50,100,000; silver, 37,800,000; lead, 37,300,000; sulphuric acid, 22,000,000; gold, 7,300,000; nickel, 6,200,000. Besides metal manufactures the important industrial products include textiles, beer, and sugar.

The industrial situation in Germany during 1901 was not satisfactory. By the middle of the year there was a serious depression in many of the most important industries, including machinery and the metal industries in general, coal, textiles, chemicals, cement, glassware, and furniture. The cause of this depression was believed to be overproduction in Germany and other manufacturing countries. The manufacturers hoped that some relief would be afforded by the commercial treaties then under discussion. In general the long-time commercial treaties were favored; largely to treaties, it is stated, is due the increase of German commerce by about \$1,000,000,000 in the last decade. It was reported in November that the industrial and commercial depression was assuming a very serious aspect, especially since the number of unemployed was increasing daily, while the condition of imperial and Prussian finances was beginning to appear unfavorable. At the end of the year the number of unemployed in Berlin was estimated as high as 80,000.

During 1901 the effect of American importations upon European industries, especially those of Germany and Austria-Hungary, was widely discussed, and various proposals were made for a general European customs union against American products. In writing upon this question, Dr. Alexander von Peez said in the *Allgemeine Zeitung*: "Not China and not the Transvaal War, but the race between the great industrial countries—England, Germany, and the United States—forms to coolly calculating politicians the foremost, weightiest, and most enduring interest of the future. England's commercial growth has been slow. Germany has risen more rapidly after gaining political unity and establishing the protective system, but like a storm is the forward movement of the United States." Dr. von Peez reviewed the various tariff systems and commercial treaties of the European countries, and suggested that the relations of the European nations to the United States should be carefully studied with a view to the establishment of reciprocity treaties. In these, he believes, lies the greatest safety of European industries. Under present conditions—that is, since 1890—American foreign products have well-nigh shattered the agricultural industries of Germany; while already the German production of coal, iron, steel, and machinery is threatened by the American products. In the three years preceding 1901, the cash balance against Europe in favor of the United States was \$1,600,000,000.

Commerce.—The customs territory (*Zollebiet*) embraces practically all of Germany. The special trade of this territory has been reported in marks as follows:

Years.	Imports.	Exports.	Years.	Imports.	Exports.
1897	4,864,644,000	3,786,241,000	1899	5,783,628,000	4,368,409,000
1898	5,439,676,000	4,010,565,000	1900	6,042,992,000	4,752,601,000

Included in these figures are specie and bullion, the imports of which in 1900 amounted to 277,000,000 marks and the exports 141,000,000 marks. The trade in 1900 exceeded that of any previous year; compared with the commerce of 1884, when the present commercial treaties went into effect, the imports show an increase of 41 per cent. and the exports an increase of 56 per cent.

The trade with countries of greatest commercial importance for 1899 and 1900 is stated in marks as follows:

Countries	1899.		1900.	
	Imports from	Exports to	Imports from	Exports to
United States	907,200,000	377,600,000	1,020,764,000	439,653,000
Great Britain	777,769,000	852,972,000	840,661,000	912,219,000
Austria-Hungary	730,364,000	466,010,000	724,332,000	510,730,000
Russia	701,700,000	396,600,000	716,535,000	324,889,000
France	303,100,000	216,700,000	305,500,000	277,600,000
Argentina	194,500,000	.....	234,600,000	.....
Belgium	240,085,000	207,073,000	220,500,000	253,100,000
Netherlands	203,291,000	327,711,000	215,400,000	359,900,000
British India	230,480,000	65,255,000	204,900,000	.....
Switzerland	176,307,000	284,666,000	.....	292,100,000

The total trade of Germany with the first four countries given in the foregoing table exceeded her trade with all the rest of the world, but the value of her exports to these countries was less than half of the total exports. It should be noted that the exports to Russia in 1900 fell considerably short of those for the preceding year and were exceeded in value by those sent to the Netherlands. Germany's trade with Mexico and the South American countries (except Chile) and with the Philippine Islands substantially increased in 1900.

The leading imports, with their values in marks, in 1899 and 1900 respectively include the following: Cotton and cotton goods, 331,700,000 and 419,900,000; wool and woollen goods, 559,600,000 and 410,800,000; silk, 177,900,000 and 200,600,000; coffee, 128,000,000 and 131,900,000; iron and iron wares, 100,600,000 and 121,300,000. The total agricultural imports in 1899 and 1900 amounted to 857,300,000 marks and 853,400,000 marks respectively. In the latter year the wheat import was valued in marks at 172,800,000; corn, 128,800,000; rye, 100,000,000; barley, 92,800,000; oats, 48,400,000. The coal export in the same year amounted to 114,600,000 marks. The value of the machinery export rose from 81,500,000 marks in 1899 to 92,400,000 marks in 1900. Among the principal exports in 1899 and 1900 respectively were: Iron and iron wares, 409,800,000 marks and 473,400,000 marks; wool and woollen goods, 359,300,000 and 354,900,000; cotton and cotton goods, 263,400,000 and 309,900,000; sugar, 204,100,000 and 227,600,000; agricultural produce, 122,300,000 and 137,700,000. The exports of machinery in the two years were valued at 250,500,000 marks and 281,700,000 marks respectively, and of rails, 13,200,000 marks and 18,700,000 marks respectively. The coal export in 1900 was valued at 209,300,000 marks. Trade statistics for the first half of 1901 show a falling off in German commerce, as compared with the same months of the preceding year. The value of the imports was 2,884,500,000 marks, or 106,700,000 marks less than during the first six months of 1900; and that of the exports was 2,253,200,000 marks, which shows a decrease of 73,000,000 marks.

The sale of American cereals has increased of late over that of Russian in the German markets. For 1897, Russian barley, oats, maize, rye, and wheat imported into Germany, amounted to 2,336,688 tons, valued at \$58,636,616; while the importation of the same cereals from the United States amounted to 1,541,229 tons, valued at \$31,334,206. In 1900, however, the Russian cereals had decreased to 1,943,063 tons, valued at \$47,944,340; while the American had advanced to 1,725,959 tons, valued at \$42,997,090. It must be pointed out, however, that in the near future American cereals will have greater difficulty in competing with the Russian products in the markets of Germany; for the construction of new railways and canals in Russia will make easier and cheaper the transportation of her crops toward the German border. It is not unlikely, moreover, that American grain will encounter sharp competition in Germany with that of Austria-Hungary; for the projected railways and canals in that monarchy will have the same effect on the transportation of grain crops as the railways and canals of Russia will have.

Communications.—On April 15, 1900, the total length of the German railways was 50,961 kilometres, of which 45,969 kilometres belonged to the imperial or state governments and 4,992 kilometres to private companies. On April 15, 1901, the total length was 51,850 kilometres, of which 46,784 kilometres were public and 5,066 private lines. On the latter date the length in kilometres of the railways owned by the government in the most important states was as follows: Prussia and Hesse, 30,918; Bavaria, 5,883; Saxony, 3,036; Württemberg, 1,843; Alsace-Lorraine, 1,661; Baden,

1,552; Mecklenburg, 1,106. The capital stock of the standard-gauge lines, 49,331 kilometres on April 15, 1900, and 50,046 kilometres on April 15, 1901, amounted on the former date to 12,134,000,000 marks; the working receipts for the year then ending were 1,840,000,000 marks and the working expenses 1,117,000,000 marks. A notable electric tramway was projected in 1901. This line, which is to be constructed at an estimated cost of \$33,000,000, will connect Berlin with Hamburg, 156 miles distant, and the trains are expected to have a speed of 125 miles an hour.

At the beginning of 1899 the waterways navigable for vessels of a 3-foot 3-inch draught aggregated 7,652 miles. This mileage was divided as follows: Navigable rivers, 4,913; canalized rivers, 1,317; canals, 1,422.

In 1899 there were reported 77,910 miles of telegraph lines, 23,729 telegraph offices, and 36,464 post offices. In that year the receipts from posts, telegraphs, and telephones amounted to 423,440,638 marks and the expenditures 374,888,392 marks.

Religion and Education.—The principle of religious liberty prevails, though most of the religious orders, particularly the order of the Jesuits, have been suppressed. In 1895 the reported number of Protestants was 32,827,841; Catholics, 18,578,285; other Christians, 167,183; Jews, 561,323. Primary education is compulsory throughout Germany. For secondary and higher education there are numerous high schools, gymnasia, etc., and technical schools and universities. The presence of large numbers of foreigners in the universities is causing some dissatisfaction in Germany. In the summer of 1901 it was reported that these foreigners numbered 2,606, of whom 855 were at Berlin, 370 at Leipzig, 232 at Munich, 159 at Heidelberg, 141 at Halle, 140 at Freiburg, 102 at Göttingen. The principal nationalities were represented as follows: 717 Russians, 507 Austrians, 323 Americans (mostly from the United States), 256 Swiss, 157 Englishmen, 154 Asiatics (mostly from Japan), 68 Bulgarians, 50 Dutchmen, 47 Frenchmen, 35 Turks. At the universities 7.3 per cent. of the student enrollment is foreign. The foregoing figures do not include the numerous foreigners at the technical high schools. In some quarters "it is felt to be unjust that so many strangers should reap the benefit of the sacrifices made by the German states for the higher education of their youth." An appropriation bill adopted in the spring of 1901 authorized subventions for 125 German schools in foreign countries. Of prime importance among these is a school at Constantinople, one each at Galatz, Antwerp, Brussels, Pretoria, Johannesburg, three schools at Buenos Ayres, and four at Bucharest.

HISTORY.

The Reichstag.—The *Reichstag* convened on November 14, 1900, and adjourned on May 15, 1901. The proposed appropriations for the Chinese expedition of 1900, which was carried on under imperial authority and without legislative sanction, called forth considerable criticism of the emperor from the Radicals and Socialists. The appropriations, however, were finally sanctioned on February 15, 1901. The measure known as the Clerical Toleration Bill, which was introduced in the *Reichstag* on December 10, 1900, failed of enactment. The Federal Council held that the plan removing religious limitations imposed by the individual states would violate the constitutional autonomy of such states. The Army Pensions Bill, introduced in the *Reichstag* on April 16, 1901, made certain provisions for men, military and naval invalided in wars carried on by Germany since the establishment of the empire or by the German states before 1871, and for the families of soldiers or sailors killed in such wars. The measure became law on May 31. In May, also, a bill was passed consolidating and amplifying the laws of copyright dealing with literary and musical works. Other measures enacted also in May were as follows: A law regulating the purity of spirituous liquors; providing accident insurance for soldiers and civil officials and strengthening state control over insurance companies; and giving to the decisions of industrial courts a more compulsory character. In the same month the *Reichstag* passed a bill authorizing the government to continue to its "most favored nation" treatment to imports from Great Britain and her colonies (excepting Canada) until December 31, 1903. At that time the commercial treaties with Austria-Hungary, Russia, Italy, and other European states will expire. The *Reichstag*, which adjourned on May 15, reconvened on November 26, 1901.

The Proposed Tariff.—The proposed revision of the German tariff laws, and in connection therewith the renewal of the commercial treaties mentioned above, and the question of Prussian canals, treated in a succeeding paragraph, were the two questions that called forth the greatest amount of discussion, parliamentary and popular, in 1901. For some two years the government had had under discussion a revision of the tariff and the proposed bill, as finally completed, was published on July 26. It evidently was designed primarily to attract the Agrarian vote, which is necessary to carry into effect the emperor's plans for canals. The new bill provided for a general tariff increase and in particular for an increase in customs on agricultural products; and it established minimum rates on cereals, below which

commercial treaties might not be concluded by the government. Provisions, however, were made for reciprocity treaties, and also for retaliatory duties against countries not according "most favored nation" privileges to Germany. The government intended the bill, if enacted, to go into effect upon the expiration of the existing treaties of commerce—that is, on January 1, 1904.

So comprehensive were the concessions of the bill to the Agrarians, showing a general advance of from 50 per cent. to 300 per cent. on food stuffs, that a storm of protest was immediately called forth from the entire liberal, industrial, and commercial press. The most important advances over the old tariff schedule were in cereals, meats, and live animals. The advance on wheat will affect most directly the United States, Argentina, Russia, and the Balkan states, while that on rye will chiefly affect Russia. The public discussion of the bill was directed principally to what German manufacturers regarded as its inadequacy in protecting their industries, and to the large advances in the duties on food products, which advances would be most keenly felt by the non-agricultural classes. So serious seemed the prospect of the increased values in food materials that the Berlin *Tageblatt* said the new tariff would "revolutionize the whole economic, industrial, and commercial status of the German people, drive a large proportion of the laboring classes back to a diet of black bread and potatoes, diminish the productive strength of the nation, and its consequent power of competition, and by provoking reprisals from agricultural nations, like Argentina, Austria, and Russia—to say nothing of the United States—imperil the foreign markets for German manufactures, which have been to so large an extent the mainstay of the empire's export trade."

The uncompromising attitude of the Agrarians in their struggle for high tariffs on agricultural products has doubtless in many instances been caused by actual need. The landlords have suffered severely by falling prices and a rising rate of farm wages. Upon the impetus toward industrialism and the general movement of population to the cities many of the landlords mortgaged their estates and bought shares in the new industrial companies. Manufacturing interests were encouraged by the emperor, who, in the expectation of large returns from this new development of German enterprise, proposed the construction of great canals and large expenditures on the navy "to protect our growing commerce." When the inevitable overproduction and reaction came—in 1900-01—the landlords, as well as those directly engaged in industrial enterprises, suffered severely. But since German agriculture is on the decline and the real hope of German prosperity seems to lie in manufacturing industries, the position taken by the government for a tariff distinctively favoring agricultural produce to the detriment, indirectly at least, of manufactures, is, according to the *New York Journal of Commerce*, "remarkable as anything ever presented in the history of national economy." It was pointed out that as soon as England realized that progress depended on her manufactures she took the taxes off food-stuffs, and that the United States, already having cheap food, had fostered industries by the protective tariff; but "Germany is undertaking to make food dear when the great national development has been in the line of manufacturing; when all the gain in population for twenty or thirty years has been in the towns; when great efforts are being made to get foreign business for the manufacturers; . . . when the industries of the country are prostrated; when wages have been reduced and great numbers of persons have been thrown out of employment, and manufacturing corporations that paid 30 per cent. dividends last year are passing their dividends this year. It would have been impossible to take action, which in its character and its inopportune-ness would be a greater blow to the industrial, and in general the urban, population of Germany."

The London *Speaker* declared that the proposed tariff would not only "force Russia and the United States to retaliatory measures, but would shake to its very foundations the Triple Alliance;" it would drive Austria, as well as Russia and the United States, to seek new markets. On the announcement of the bill the Austro-Hungarian minister in Berlin advised the German government that its enactment would doubtless have a prejudicial effect on the Triple Alliance, while later both M. Szell, the Hungarian premier, and Count Goluchowski, the Austro-Hungarian foreign minister, declared that no treaty of commerce could be concluded with Germany on the basis of the proposed bill. M. Szell added that by adopting the tariff Germany "would raise the whole world in opposition to her." The semi-official Vienna *Fremdenblatt* went so far as to say, "If Germany wishes a tariff war, Austria, Russia, and the United States will be ready to accommodate her."

In introducing the tariff bill in the *Reichstag* on December 2, 1901, Count von Bülow, the imperial chancellor, attempted with little success to reconcile the opposing agricultural and industrial interests. "Possibly," said the London *Spectator*, "if he could have arranged so that each party could be present during one-half of his speech and absent during the other, he might have achieved some success." The chancellor said that Germany was exclusively neither an industrial nor an

agrarian state, but both at once, and that while the purpose of the tariff was to "meet the wishes expressed by the agricultural interest in favor of increased protection," the bill furnished the basis on which a good system of protection and a "fair compromise" might be founded. This "fair compromise," however, was not obvious. The chancellor seemed unconscious of the distress existing in many branches of German industry, and the argument that high prices for farm products mean an increase in the cost of living seemed to have little weight with him. It seemed, indeed, that his position was due not so much to a desire for the amelioration of economic conditions as to his wish to secure parliamentary approval of the ministry. Even this, however, did not seem absolutely certain, since some of the Agrarian extremists announced that though the proposed tariffs on foreign products were high they would not vote for the bill unless these tariffs were made practically prohibitive. When the *Reichstag* adjourned for the Christmas recess, the debate on the first reading of the tariff bill had been concluded and the bill referred to a committee. At the close of 1901 opposition, both in the *Reichstag* and among the people, had become so keen that the bill seemed to have small chance of enactment in its existing form.

The Meat Inspection Law.—The meat inspection law, which was enacted in May, 1900, does not seem to be popular. Although the government insisted that the bill was essentially a sanitary measure, and although in its final form it was not generally approved by the Agrarians, still in 1901 it was regarded in some quarters as "a cloak, faded and worn, hung over the Agrarian idol." Since the law went into effect the prices of meat have risen materially, and as foreign canned meats, corned beef, sausages, etc., are entirely excluded, fresh meats considerably more expensive are forced on the market. Such a condition is burdensome to the industrial population.

Strikes.—During 1900 there were begun in Germany 1,492 strikes and 1,433 strikes were brought to an end. These strikes affected 7,740 different business concerns and 298,819 persons, while the greatest number of persons on strike at one time was 122,803. In proportion the number of lockouts was exceedingly small.

Early in 1901 the German supreme court handed down a decision, which though involving an insignificant amount of money was of great importance in establishing a principle touching strikes. The case arose from the refusal of twenty molders employed in an iron foundry to finish some models sent from a foundry where a strike was on. They were finally discharged without the usual notice and were sued for damages by the employer. Judgment was rendered in favor of the plaintiff, holding the defendants jointly and separately for the entire damage, and the superior court, to which appeal was taken, affirmed the verdict. The court held that the law does not expect an employer to yield to the unlawful refusal of his employees to do certain work, although the latter may be willing to do other work; while the immediate discharge of the defendants did not exclude the claim for damages, since the premature dissolution of the labor relation was caused through the defendants' own fault, for the detrimental consequences of which they were responsible.

Colonies.—During the debates in the *Reichstag* on the colonial estimates in March, 1901, Dr. Stuebel, the director of the colonial department of the foreign office, admitted that the commercial development of the German colonies had been disappointing—a fact he attributed to difficulties of internal communication. He denied the accusations of Herr Bebel that recent revolts in German colonies were due to the hut tax, and stated that efforts were being made to ameliorate as far as possible the abuses accompanying domestic slavery in German East Africa. In the last few years the colonial budget has greatly increased, while so insignificant are the German customs receipts on products imported from German colonies that it is thought both the mother country and the dependencies would benefit by the abolition of such duties.

German Anglophobia.—During 1901 the spirit of the German people, if correctly reflected by the German press, was distinctively anti-British. The Anglo-German agreement of October 16, 1900, concerning China was coldly received by the people, and the unusually friendly attitude of Emperor William on his visit to England at the time of Queen Victoria's funeral called forth little applause, while soon after the conferring by the king of the Prussian Order of the Black Eagle upon Earl Roberts was widely disapproved. Great Britain's war against the Boers was extremely unpopular in Germany, although the government maintained strict neutrality. In November, 1901, popular feeling against the British became intense through a speech on the war, in part misunderstood, made in Edinburgh by Mr. Chamberlain, the British colonial secretary. At the close of the year the German press was very bitter against Great Britain.

Prussia. The Bicentenary.—The two-hundredth anniversary of the founding of the Prussian monarchy, that is, the coronation of Frederick I., was celebrated throughout the kingdom on January 17 and 18, 1901. King William issued a decree, signed by all the Prussian ministers, founding a new order to be called the Order of Merit of the Prussian Crown, and to rank immediately after the Order of

the Black Eagle. The king also distributed 3,772 decorations and honors and appointed fifteen new peers to the *Herrenhaus*.

A New Prussian Canal Bill.—It will be remembered that in August, 1899, the lower chamber of the Prussian *Landtag* rejected the canal bill introduced by the government, providing for the construction of waterways, navigable for vessels of considerable tonnage, between the Rhine and the Elbe, by way of Dortmund and Minden, and for the canalization of the Weser from Bremen to Minden. At that time a canal had just been opened from Dortmund to the Ems. The stoppage of further progress to the canal plan, which for some time has been one of the king's favorite measures, was due in large part to the Agrarian and Conservative influence that is suspicious of Germany's new industrial progress and her increasing foreign commerce, since these developments, it holds, are inimical to German agriculture. Especial opposition was brought against the bill by the poorer agricultural provinces east of the Elbe; these provinces urged that while the entire kingdom would bear the canal expenditure, only the western half would in any way benefit thereby, and that they, moreover, would particularly suffer from the more active competition of foreign agricultural produce in the Berlin and other important markets. Consequently the new canal bill, which was communicated by the government to the *Landtag* on January 12, 1901, endeavored to remove the favoritism of the west at the expense of the east. The bill provided for the extension of the canal system practically to all parts of Prussia, and accordingly involved a much greater expenditure than that contemplated by the defeated measure of 1899. The total outlay proposed amounted to 389,010,700 marks. This sum was designed to cover the cost of construction of the following waterways: A Rhine-Elbe canal (260,784,700 marks); a ship canal between Berlin and Stettin on the Oder (41,500,000 marks); a canal connecting the Oder and the Vistula, and a channel rendering navigable for ships the Warthe from its confluence with the Netze to Posen (the two works to cost 22,631,000 marks); participation in the improvements in the Lower Oder and Upper Havel (40,989,000 marks and 9,670,000 marks respectively); the canalization of the Spree (9,336,000 marks); a canal effecting communication between the province of Silesia and the waterway now connecting the Oder and the Spree. The opposition to the bill became so strong that in April the Agrarians indulged persistently in obstructive tactics, and by the end of the month the government clearly realized that the measure could not be put through. Accordingly it was disinclined to continue a useless discussion, and on May 3, 1901, Count von Bülow, the minister-president, prorogued the *Landtag*. The ministers of finance, agriculture, and commerce, Dr. Johannes von Miquel, Baron von Hammerstein-Loxton, and Herr Brefeld, respectively, who were suspected of being hostile to the bill, were called upon to resign. They were succeeded by Baron von Rheinbaben (who was transferred from the ministry of the interior) as minister of finance, General von Podbielski, as minister of agriculture, and Herr Möller, as minister of commerce. Baron von Hammerstein, who held an administrative position in Lorraine, became minister of the interior. Aside from the royal determination to retain a ministry favorable to the canal scheme, for the enactment of which the king is still persistent, the change in ministry had little political significance.

The Department Store Law.—The law enacted by the Prussian *Landtag* in July, 1900, and taking effect on January 1, 1901, which authorized special taxes on department stores, did not seem during 1901 to correct the abuses against which it was aimed. The fact that during the second half of 1900 there was a dull market for German manufactures enabled the department store managers to contract for supplies at prices that practically nullified the effect of the new taxation. But more serious than this temporary condition is the unforeseen application of the law to various merchants, for whose protection it was especially enacted. Indeed, a number of these middlemen have been compelled to give up their business, either wholly or in part, or to pay the tax, while increasing power and success have attended the department stores.

The Polish Question.—During 1901 a considerable amount of discontent developed among the Poles of eastern Prussia, which was formerly a part of the Polish kingdom. For a number of years the Poles have striven against "Germanization," and of late, not only in German Poland, but in Russian and Austrian, their aspiration for racial entity has become more and more apparent. The Germans have attempted unsuccessfully to wrest from the Poles economic supremacy in eastern Prussia; at present the most important landholders are largely Polish, and attempts have been made to boycott German commerce. German is the official language, and is used in the schools, but up to 1901 religious instruction was given in Polish. Upon the extension of the German language to religious education the Poles showed intense disapproval, and in the fall of 1901 certain Polish children at Wreschen, in Posen, acting on the advice of their parents or the priests, refused to receive such instruction. The children were publicly flogged and disturbances in which the parents took

part ensued; as a result a number of Poles were imprisoned for terms extending from a few weeks up to two years. The affair created much excitement not only in Posen, but in Russian Poland and Galicia; in Warsaw, Lemberg, and Cracow violent anti-German demonstrations took place. So strong was the anti-German feeling in eastern Prussia at the close of the year that it seemed likely the authorities would adopt a more conciliatory attitude.

GETTY, General GEORGE WASHINGTON, brevet major-general, U. S. A. (retired), died at Forest Glen, Md., October 3, 1901. He was born at Georgetown, D. C., October 2, 1819, and graduated at West Point in 1840, entering the army in the artillery service. After serving through the Canadian border war, the Seminole Indian War, and the Mexican War, and attaining the rank of captain, he entered the Union army in the Civil War with the Army of the Potomac. He fought in the engagements at Yorktown, Gaines' Mill, Malvern Hill, South Mountain, and Antietam, and in the course of the war was brevetted lieutenant-colonel, colonel, brigadier-general, and major-general in the regular army. In 1866 he became colonel of the 37th infantry, was transferred to the 3d artillery in 1871, was in command of the troops along the Baltimore and Ohio Railroad in 1877, and in 1888 retired from active service.

GIBB, ELIAS JOHN WILKINSON, British Orientalist, died in London, December 4, 1901. He was born in Glasgow in 1857, and was educated at the university in that city. Upon his graduation he took up the study of the Turkish language and literature, and in 1879 brought out his first translation, *The Capture of Constantinople*, from the Turkish of Sa'd-ud-dun. Following this came, in 1883, *Ottoman Poems*, the first to be translated into English. Others of Mr. Gibb's translations were: *The Story of Jewad* (1884); *The History of the Forty Vezirs* (1886); *Aucassin and Nicolette*, translated from the French of the twelfth century (1887). He wrote the articles on Ottoman literature in the *Encyclopædia Britannica*. During the last thirteen years of his life Mr. Gibb was engaged upon a *History of Ottoman Poetry*, which, projected as a five volume work, would have been an encyclopædia of Moslem literature; but only the first volume was published.

GIBRALTAR, a British crown colony commanding the entrance to the Mediterranean, has an area of only 1.9 square miles, and its population in March, 1901, was 27,460, of which 6,475 belonged to the military. The governor and commander-in-chief (General Sir George Stewart White in 1901) exercises all the functions of government, both legislative and executive, without the aid of councils. The revenues, for the most part derived from port dues, land rentals, and excise, amounted in 1900 to £61,418, and the expenditures to £61,812. The public debt is £19,253. The tonnage of the vessels entering and clearing at the port during 1900 was 8,750,000, being much above the average of the past five years. Almost three-fourths of this was British. The port is free and the transit trade is extensive. During 1900 rain-water reservoirs with a capacity of 5,200,000 gallons were constructed in the rock. More than usual interest attaches to the dock and harbor improvements, upon which the government is expending over £4,800,000, by reason of a report circulated during the summer of 1901 that it had been found that both dry-docks and coaling moles are directly under the fire of the Spanish guns at Algeciras.

GILBERT, Sir JOSEPH HENRY, English agricultural chemist, died at St. Albans, England, December 23, 1901. He was born at Hull, August 1, 1817, and was educated at the University of Glasgow, at University College, London, and in chemistry under Liebig at Giessen. After a short experience as a teacher he went, in 1843, to the chemical laboratory at the Rothamsted agricultural experiment station to become associate to J. B. Lawes. He remained here for fifty-seven years; Lawes died in 1892. The results of the joint labors of these two men are of the greatest value to agriculturalists. In 1884 Gilbert was appointed professor of rural economy at Oxford, a chair he filled for six years, while retaining his connection with the Rothamsted station. In recognition of his services he was awarded a medal by the Royal Society (1867), and in 1893 he gave a series of lectures in the United States, the provision for which was made by the Lawes Agricultural Trust. The results of the Rothamsted experiments have been published from time to time in the *Journals* of the Royal Agricultural Society of England, in the *Reports* of the British Association for the Advancement of Science, in the *Proceedings* and *Transactions* of the Royal Society of London, and in the *Journal* of the Horticultural Society of London.

GILLE, PHILIPPE EMILE FRANÇOIS, French journalist and playwright, died in Paris, March 19, 1901. He was born in Paris, December 18, 1831, and was trained as a stone-cutter. Later he entered the government service, and in 1861 was made secretary of the Théâtre Lyrique. After some years of journalism, on the staff of the *Petit Journal*, *l'Histoire*, *le Soleil*, and *le Figaro*, in which he wrote under the pseudonym of *le Masque de Fer*, he devoted himself to dramatic writing. As librettist he worked with Bizet on *la Prêtresse* (1854); with Offenbach on *le Docteur Oxy*

(1877); with M. Leo Delibes on *l'Ecossois de Chaiou, la Cour du Roi Pétaud* (1869); and with Jules Costé on *les Horreurs de la Guerre* (1869). Alone he wrote a one-act comedy, *Camille*, which was presented at the Théâtre Français in 1890. He also published a volume of poems, *l'Herbier* (1887), and a collection of articles from *le Figaro* under the title *le Bataille Littéraire* (1889).

GILLESPIE, ELIZABETH DUANE, American organizer of women's societies, died in Philadelphia, October 13, 1901. She was born in Philadelphia, January 15, 1821, the great-granddaughter of Benjamin Franklin, and in 1849 married Lieutenant Gillespie of the U. S. Marine Corps. During the Civil War she was in charge of one of the hospitals for wounded soldiers, and later was a member of the committee formed to raise funds for the Philadelphia Centennial, and had a large share in erecting and furnishing the Woman's Building. She was one of the founders of the Colonial Dames (1881), and was prominent in other Revolutionary associations. Mrs. Gillespie unveiled the tablet to Benjamin Franklin in the New York University Hall of Fame in 1901.

GILMAN, DANIEL C. G., president of the Johns Hopkins University since 1875, resigned this position September 1, 1901, and was enrolled by the trustees as president emeritus. He was succeeded by Ira Remsen, the professor of chemistry in the same institution. In the January following Mr. Gilman was chosen president of the Carnegie Institution of Washington, D. C. He holds some other important stations, among them that of president of the American Oriental Society, vice-president of the Archaeological Institute of America, president of the National Civil Service Reform League, president of the Slater Fund for the Education of Freedmen, and vice-president of the Peabody Education Board for Promoting Education in the South.

GIRLS' FRIENDLY SOCIETY was founded in England in 1875. Its purpose is to bring young women and girls together for social intercourse, to promote purity, uprightness, thrift, and faithfulness to duty. It was organized under the auspices of the Church of England. The movement has not been confined to England, however, but has extended, until now the society is established throughout the English-speaking world. The American society was organized two years after the inception of the movement and now has 370 branches, with a membership of about 20,000. Although the society is under the auspices of the Protestant Episcopal Church, no question of religious views is involved in membership. It is open to girls of all denominations. Associates, however, must be of the Protestant Episcopal Church. The American branch publishes the *Girls' Friendly Magazine*. The president is Miss Elizabeth H. Wisner, of New York; and the secretary, Miss Agnes D. Abbat, of Westchester, N. Y. The central office is at 281 Fourth Avenue, New York.

GLACIERS. H. F. Reid has, during the year 1901, published a paper on *The Variation of Glaciers*, in No. 6 of the *Journal of Geology* (vol. 9, page 250), in which he gives the records of a number of glaciers for 1899, and summarizes the *Fifth Annual Report* of the International Committee on Glaciers. The condition of the United States glaciers is also treated. He notes the discovery of a small one on Mount Arapahoe, in Colorado, which makes the second existing glacier known in that State. All of the other glaciers, including those in Alaska, show signs of retreat. On September 3, 1899, an earthquake shock on the Alaskan coast caused a large quantity of icebergs to break loose from ice extending down to the tide water. Muret and Finstewalde, in the *Sixth Annual Report* of the International Commission on Glaciers, give a summary of the condition of the glaciers of the Northern Hemisphere in 1900. Those of Switzerland are still retreating, there being but one exception, that of Boveyre, in the Val de Entremont. C. Rabot has published a paper entitled *Les Variations de Longueur des Glaciers dans les Régions Arctiques et Boréales*. (Archives de Sci. Phys. et Nat. Geneva, 1897-99.)

GLASGOW INTERNATIONAL EXPOSITION. This exhibition, which had for its object the presentation of the manufactures, products, industries, and material resources of all nations, and of the machinery and appliances relative thereto, and also of articles illustrative of science and art, including ethnology and archaeology, was held in Glasgow, Scotland, from May 1, 1901, to October 1, 1901. The site, which covered ninety-seven acres, was granted by the city corporation, and comprised the western portion of Kelvin Park and the Bunhouse grounds. The river Kelvin, which flowed through the grounds, was used for the exhibition of naval shipbuilding and life-saving apparatus, both in motion and stationary. The principal buildings were built from designs prepared by Mr. James Miller, and were four in number, as follows: a Fine Arts Gallery, an Industrial Building, a Machinery Building, and a Grand Hall for entertainments. The Art Gallery, which was a permanent building, cost about £250,000, and was built from the surplus and accumulated interest from the Exhibition of 1898, together with subscriptions from private citizens. The buildings, in which were shown the industrial and the machinery exhibits, were in the Spanish Renaissance style of architecture. The Industrial

Building was 700 feet long by 360 feet in width, and was crowned by a huge dome 80 feet in diameter. A wide avenue 92 feet in width and 150 feet in height extended longitudinally through this building, under a massive circular arched roof. The building had four towers, reaching a height of 180 feet above the ground level. Around the exterior of the dome, at a height of 100 feet above the ground, was a large balcony, from which an excellent view of the grounds could be obtained. The Machinery Building was 500 feet in length by 320 feet broad, and consisted of one central bay 100 feet wide, and four other bays, each 53 feet in width. The height of the central span was 41 feet, and that of the side spans 29 feet. The central bay was flanked on each side by an overhead gallery 15 feet wide. The exhibits were distributed among eight classes, as follows: Electricity, Fine Arts, History and Archaeology, Labor-Saving Machinery, Locomotion and Transportation, Marine Engineering, Sports, and Women's Industries. Among the foreign governments participating were Austria, France, Denmark, Japan, Mexico, Morocco, Persia, and the United States, and the various colonies of Great Britain, including Australia, Rhodesia, South Africa, and Canada, several of which had special buildings. During the time of the Exhibition numerous scientific organizations held their meetings in Glasgow, among which were the British Association for the Advancement of Science, the Institute of Mechanical Engineers, the Society of Chemical Industry, the Society of Engineers and Shipbuilders, and the Institute of Naval Architects. The University of Glasgow also celebrated the 450th anniversary of its foundation during the summer.

GLEASON, PATRICK JEROME, American politician, died at Long Island City, N. Y., May 20, 1901. He was born in Ireland in 1844, and came to the United States in 1859. After serving with credit through the Civil War in the Union Army, he settled in Long Island City and engaged in municipal politics. He was elected mayor in 1887, and while holding this office earned the title of "Battle-Axe" Gleason, by going out at the head of the city's police force armed with a huge axe and cutting away obstructing gates and sheds that a railroad company had erected in the streets. He served four strenuous terms as mayor of Long Island City, during which time he was the subject of many newspaper stories dealing with the unconventional methods of his administrative procedure.

GOETHALS, PAUL, head of the Roman Catholic Church in India, died at Calcutta, July 4, 1901. He was born in Belgium in 1833, and had a long and distinguished career in the church of that country before being sent to India. In 1878 he was nominated to the bishopric of Calcutta, and in 1886 was made archbishop of the same diocese, the most important in India, under the direct jurisdiction of the Propaganda at Rome.

GOLD. The production of gold in the United States in 1900 was valued at \$78,159,674, and its value in 1901 will probably exceed \$81,000,000. The following table, prepared from the estimate of the director of the mint, indicates the gold production by States for 1900 and 1901:

	1900.	1901.	Increase.
Colorado	\$29,500,000	\$29,000,000	*\$500,000
California	14,377,200	15,730,700	1,353,000
Alaska	7,771,000	6,904,400	*866,600
South Dakota.....	6,617,674	6,601,800	*15,874
Montana	5,126,615	5,023,300	*103,315
Arizona	3,500,000	4,193,400	693,400
Utah	4,237,726	3,824,300	*413,426
Nevada	2,350,000	3,000,000	650,000
Idaho	2,067,183	2,273,900	206,717
Oregon	1,715,762	1,777,800	62,038
New Mexico.....	900,000	832,900	*67,100
Washington	826,873	620,200	*206,673
Other States.....	332,248	430,100	97,852
Total	\$79,322,281	\$80,212,800	\$890,521
*Decrease.			

In 1900 the value of the gold production of the United States exceeded that of all minerals except pig iron and copper. The latter in this year had an unusually high value; consequently gold production should occupy normally the second place. The world's production of gold in 1900 was very nearly \$256,000,000, an amount which was exceeded in 1901. The United States leads in the production of gold, with Australia second, and Canada third. Most of the production of the last-mentioned country comes from the Yukon district and in part from southwestern British Columbia, with smaller quantities from western Ontario and Nova Scotia. Gold

GLASGOW EXPOSITION.—Opening of the Exposition by the Duke and Duchess of Fife.

mining in the Transvaal has naturally been almost at a standstill, but in spite of the war the production is likely to reach \$4,700,000, an amount which makes an interesting comparison with the output of 1898, which was valued at \$78,070,761. A moderate quantity of gold was produced in 1901 by Mexico and Central America, while the Dutch East Indies showed new developments that appeared very promising. There is a continued improvement in the sale of lower grades of ore as methods suitable for this treatment are being developed. The Cripple Creek region of Colorado and that of Leadville in the same State, doubtless had an increased production in 1901, but definite returns are not yet available. Along the Pacific coast the method of dredging gold from river gravels is growing in favor. In some cases these dredges are located on the rivers, while in others the dredge may be more than a mile from the stream. In such instances the dredge has often been built in an excavation which has been dug over the line of some buried river gravel and water is then let into the excavation to float the dredge. The gravel dredged is brought on board where it is discharged onto a coarse screen which separates the large stones, while the finer material, such as pebbles and sand, with the flakes of gold passes through the meshes and is washed over amalgamated plates and felt for the purpose of catching the gold. At the present time in the United States gold is being dredged in California, Washington, Idaho, Montana, Colorado, Utah, and Northern Georgia, while in foreign countries dredges are in operation in New Zealand, Australia, and more recently in the Urals. In the Black Hills of the South Dakota region the enlarging use of the cyanide process for treating gold ores has caused a considerable increase in the output of the district, but in Washington and Utah there has been a slight decrease in 1901. The Cape Nome gold deposits are now being worked more systematically and the output of gold from the American side of the Yukon is on the increase. In the eastern United States the same is true of North Carolina, but the reverse is found the case in Georgia. C. J. Alford, in a paper on *Gold Mining in Egypt (Mining and Metallurgy, 1901)*, describes the discovery of some ancient gold mines and milling plants in that country. An interesting article on gold-dredging in eastern Russia, by C. W. Purington and J. B. Lanfield, has been published in the *Engineering Magazine*, xxii, p. 399.

GOLD COAST, an English colony on the west coast of Africa, with sea front of about 350 miles on the Gulf of Guinea. Extending inland from the gold coast proper to a distance of about 300 miles from the sea is a protectorate comprising Ashanti and Adansi; the entire territory is bounded on the west and north by the Ivory Coast and the French Soudan, and on the east by Togoland, a German possession. The area of the colony proper (exclusive of Ashanti and Adansi) is about 40,000 square miles; the population is estimated at 1,500,000. The climate is malarial and very unhealthful for Europeans, and the white inhabitants number only about 500. The administration of the colony is in the hands of a governor, who is assisted by an executive and legislative council of six members with three other unofficial members. The governor in 1901 was Major Matthew Nathan. There is a commissioner and commandant of the northern territory of the Gold Coast resident at Kumassi, which is the main city of Ashanti. In 1901 Major A. H. Morris, who had commanded the garrison at Kumassi during the insurrection of 1900, held this position. The country is self-supporting; the receipts in 1900 were £585,583, an increase of £162,788 over the previous year. The expenditures were £515,567, an increase of £205,999 over 1899. The imports and exports, however, fell off in 1900, partially because of the trouble with the natives. The imports amounted to £1,294,963 and the exports £895,446. The chief articles of export in 1900 were rubber, £328,156; palm oil, £238,812; timber, £67,747; palm kernels, £96,936; cacao, £27,280. Gold is produced in considerable quantities. Most of the trade is with Great Britain. There are government schools at Accra, Cape Coast Castle, and Insein, but most of the education is in the hands of the Roman Catholic, Wesleyan, and German Reformed Missions, which direct schools comprising about 11,000 pupils. The principal towns are Accra (population, 16,276), Elmina (10,530), and Cape Coast Castle (11,614). These towns are lighted and policed. The government has built 700 miles of telegraph in the colony and has begun a railway from Sekondi harbor on the coast to Tarkwa, which is the centre of the gold-mining district. This road is to be pushed on to Kumassi, a distance of 180 miles beyond Tarkwa. In 1901 there was a considerable increase in mining activity in the Gold Coast. At Sekondi the number of prospectors, engineers, etc., that came on the steamers during the early part of the year was so great as to strain the accommodations. Considerable quantities of supplies and mining machinery also came to this port. There is a natural harbor at Sekondi, where landing can be made in keel boats. The *London Times* published a statement in May, 1901, that the plan for the removal of the government from Accra to Sekondi was being considered. A new steamship service is promised from Liverpool direct to the Gold Coast. This will place the region within thirteen days of England.

In 1901 the British government issued a blue-book upon the subject of the Ashanti war of the previous year, which threw new light on the causes of the uprising. It appears that the Ashantis, who by inheritance are a distinctively warlike people, had never become reconciled to the overthrow of their king, Prempeh, in January, 1896, and that subsequently they had continually chafed under the British yoke. They seem especially to have blamed themselves for permitting the submission of Prempeh without striking a blow in his defense. The evidences of British authority particularly disagreeable to them were the abolition of slavery and human sacrifices, compulsory labor on public works, fines for disobedience, and the increase of foreign traders. So great was the discontent that when in the latter part of March, 1900, a British force was dispatched to investigate conditions in the Atchima district, and also to capture, if possible, the "golden stool," the symbol of Ashanti royalty and power, rebellion broke out and the siege of Kumassi began. It appeared then, as had already been suspected, that the Ashantis for some time had been collecting military supplies and weapons. Early in 1901, 300 men of the West African Regiment, stationed at Kumassi, deserted and went to Cape Coast Castle. On March 31, 1900, troops left Accra for this place, and easily captured the mutineers; the ringleaders were shot and the others were shipped to Sherbro Island.

GOLF. Other than the extension of the restriction of the term amateur, which now disqualifies any person who "receives free transportation and free board, or whose club dues are either remitted by the club or not paid by himself," no alteration of importance was made in the rules in 1901. In the implements of the game a new ball, which differs from the old patterns by reason of having a small solid core of guttapercha, round which is wound lengths of thin thread-like india rubber, while over this is a guttapercha cover, was introduced in 1901. Travis used it in his championship match, and may have owed his success to it, for it doubtless drives farther than the old patterns. On the other hand, in inexperienced hands, it is over lively, and likely to be more detrimental than helpful. The men's amateur championship of the United States was held over the Atlantic City course September 9-14, 1901, and 124 started in the medal play round. On the third day the number of contestants was reduced to four: W. Egan, of Chicago; C. H. Seeley, of Weeburn; Findlay S. Douglas, of Nassau (L. I.); and Walter J. Travis, of Garden City. The final match between Travis and Egan, postponed on account of the death of President McKinley, was won by Travis, 5 up and 4 to play. The women's championship was played over the Baltusrol (N. J.) course October 8-12. The surprise of the medal play round was the failure of both Miss Griscom, the champion of 1900, and Miss Ruth Underhill, champion of 1899, to qualify. There were 82 entries, reduced to 16 by the medal test round. The final contest lay between West and East, Miss Genevieve Hecker, of Essex, N. J., defeating Miss Lucy Herron, of Cincinnati, 5 up and 3 to play. The general quality of the play was distinctly higher than that of any previous year. The open championship (i.e., open to professionals) was played over the Myopia course, and won by Willie Anderson, professional of the Pittsfield Club.

The following local and divisional championships were played: All Florida championship, won by Dr. L. H. Harban (Columbia); the Southern Florida championship, won by C. L. Tappin; the Southern California championship, Walter Fairbanks (Overland Park); Interscholastic, St. Paul's School team (L. I.); the Metropolitan championship, Findlay S. Douglas (Nassau Club); the New Jersey State championship, Allan Kennaday (Montclair); the Connecticut State League championship, C. H. Seeley (Weeburn); Colorado State championship, Frank L. Woodward (Overland Park); Western Golf Association championship, Philip B. Hoyt (Glen View); Maine State championship, Harris B. Fenn (Poland Springs); Massachusetts State championship, L. P. Myers (Yale); Pacific Coast championship, H. M. Sears (Los Angeles); Wisconsin State championship, Hamilton Vose (Milwaukee); the Intercollegiate Team championship, Harvard. The open championship of Great Britain (in which W. H. H. Hilton, the amateur champion played) was won by James Braid, Vardon was second, Taylor third, and Hilton fourth.

GORE, ALBERT AUGUSTUS, C. B., British surgeon-general, died at Whitchurch, Shropshire, March 11, 1901. He was born at Limerick, Ireland, December 1, 1839, and was educated in London, Paris, and Dublin. Joining the medical staff of the army in 1860, he served in the Sierra Leone operations, 1862-63, and distinguished himself in the yellow fever epidemic there in 1868, served in the Ashanti War, 1873-74, and afterwards as chief medical officer at various base hospitals in Egypt and central India. He became principal medical officer of the British army after the Indian campaigns of 1896-97, was retired in 1898, and created a commander of the Bath in 1899. He wrote a number of books, among which are: *The Story of Our Services Under the Crown* and *A Medical History of Our West African Campaigns*.

GORKY, MAXIM (Alexey Maximovich Pyeshkoff), a Russian novelist, whose studies of tramp life have been for some years familiar to the readers of his own country, and whose *Foma Gordyeyef* was translated into English in 1901, was born at Nijni-Novogorod, March 14, 1868 (or 1869). When still a young child he was left an orphan and was apprenticed to a shoemaker. In rapid succession the boy tried the life of an engraver's assistant, of a student of religious painting, of a scullery boy, and of a gardener's assistant, and at fifteen was assistant cook on a steamboat. While there he became interested in French romance, and he left the ship to try for an education in the schools. But failing to obtain free tuition, he took to the road as a tramp, and from that time, with occasional interruptions, he lived with tramps, going on foot over nearly the whole of Russia and living by turning his energy to whatever offered. In 1893 he first attracted attention by the publication of a short story called *Chelkash*, the success of which was immediate. Thereafter he devoted himself to writing, and has produced altogether more than thirty stories, dealing generally with tramps and the haunts of vagabondia. Gorky writes with sympathy and great realistic detail, depending more upon character drawing than plot for his effects. His stories are far from being cheerful, and the pen-name, "Gorky," which he adopted, translating into "bitter," suggests the tone of his most characteristic work.

GOT, FRANÇOIS JULES EDMOND, French actor, died in Paris, March 20, 1901. He was born October 1, 1822, at Lignerolles, in the department of Orne, and was educated at the Lycée Charlemagne. After holding a clerkship in the government service he entered the Conservatoire in 1841, where he studied under Provost and won second and first honors in 1842 and 1843 respectively. He served a year in the army, and then (1844) made his debut at the Comédie Française, of which he became a member in 1850. There he sprang into immediate fame as a comic actor. In his subsequent connection with the theatre, he enacted more than 150 rôles in the classical and modern drama. His connection with the Comédie was almost continuous until 1895, when he retired from the stage. M. Got wrote libretti for *François Villon* (1857), and *l'Esclave* (1874), and was made a knight of the Legion of Honor in 1881, being the first actor to be thus honored.

GOURKO, Count JOSEPH VASILYEVICH, Russian field-marshal, died at Tver, January 29, 1901. He was born in Lithuania, November 15, 1828. Entering the army in 1846 as cornet, he served through the Crimean War and the Polish insurrection of 1863, winning distinction in both conflicts, and in 1876 had risen to the rank of major-general with the command of a division. During the Russo-Turkish War (1877-78), General Gourko astonished the military experts of Europe by conducting a detachment of the army across the Balkan Mountains in the middle of winter,—a feat which had been deemed impossible,—took Sofia, Philippopolis, and Adrianople, and rendered signal assistance at the siege of Plevna in command of the Roumanian cavalry. In recognition of his services he was made a count, adjutant-general of the army, and in 1879, governor-general of St. Petersburg. In the following year, for not foreseeing and preventing an attack made on the life of Alexander II. he was exiled, but was recalled shortly afterward and appointed governor-general of the Polish provinces by Alexander III. in 1883. After a rigorous administration he resigned his office in 1894, and retired from public life with the rank of field-marshal.

GRAMME, ZÉNOBE THEOPHILE, inventor of the armature bearing his name, died in Paris, January 20, 1901. He was born in Belgium in 1826, and after working as a carpenter became connected with the "Alliance" factory in the capacity of mechanic and was engaged in the construction of dynamos and arc lamps, at that time used only for lighthouses or experimentally. He was also employed by Ruhmkorff, the celebrated Parisian instrument maker, and gained a knowledge of the principles involved in electrical machinery. His invention of the ring armature (1870) came a few years after Wild had discovered that the current from the revolving coils can be used to excite the field magnets. The principle of the ring armature had already been invented by Pacinotti, but it had not been brought to general notice or constructed in a practical form, so that when Gramme made his independent discovery of the same device he received the credit of the invention. He constructed successful dynamos which he exhibited at the international expositions of Vienna (1873), Philadelphia (1876), and Paris (1876 and 1888), and which, by showing their practical value, did much to make electric lighting general. For his work in electrical science Gramme received many honors.

GRAPHITE. The production of graphite in the United States in 1900 amounted to 5,507,855 pounds of refined graphite, and 611 short tons of crude graphite, having a total value of \$197,579. The production of 1899 was 2,900,732 pounds of refined and 2,324 short tons of crude, valued at \$167,106. There was also produced in 1900, 860,750 pounds of artificial graphite. The 1900 output came from New York, Pennsylvania, Michigan, and Rhode Island, and the great increase was due to Chester County, Pa.

In spite of the greatly increased output of the domestic mines the quantity produced was by no means sufficient to supply the demand and the imports continued to be large. In 1900 they were valued at \$1,390,141, which was seven times that of the domestic product. A review of the last few years shows that in 1897 the value of the imports was four times, in 1898 ten times, and in 1899 twelve times the domestic product. Most of the imported material comes from Ceylon and Bohemia, and Canada may become an important producer in the future.

GRAS, General BASILE, French soldier and inventor, died at Auxerre, France, April 15, 1901. He was born at Saint-Amans-de-Pellegrin, Tarn-et-Garonne, January 2, 1836, and entered the Polytechnic School in 1854. He became first lieutenant of artillery in the army in 1858, captain in 1864, and instructor of artillery officers. In 1871 the French War Department wished to change the system of armament, and Gras submitted a model of a rifle which was adopted and used until replaced by the Lebel model in 1886. In 1882 he became inspector of arms at Paris with rank of colonel, and was made brigadier-general in 1888.

GRAY, ELISHA, American electrician and inventor, died at Newtonville, Mass., January 21, 1901. He was born at Barnesville, O., August 2, 1835, and in his early life worked at carpentry and blacksmithing. At the same time he pursued scientific studies and attended Oberlin College. His first inventions included an automatic self-adjusting relay, a private line printer, a repeater, and a telegraphic switch and annunciator for hotels, but his most important discoveries were in the development of his system of electro-harmonic telegraphy for transmitting sounds over telegraph wires. He found that a sound produced near a magnet will cause a magnet with a similar adjustment to respond to its tone. On the basis of this discovery Gray filed a caveat at the patent office in Washington, with the ultimate idea of perfecting "the art of transmitting vocal sounds telegraphically." A month later the famous patent for the Bell telephone was granted to Professors Dolbear and Bell, and gave rise to almost endless litigation and controversy between these inventors and Gray. The claims of Bell as the inventor of the telephone were subsequently upheld by the Supreme Court, and the rights of the Gray invention, which were acquired by the Western Union Telegraph Company, were not utilized by this corporation, which, in return for a monetary consideration, conceded the claims of the Bell company. Gray invented the telautograph, and at the time of his death was interested in a new system for the transmission of fog signals. Shortly before his death he published *Nature's Miracles; or, Familiar Talks on Science, Vol. III., Electricity and Magnetism*.

GRAY, WILLIAM C., American religious editor, died in Chicago, September 29, 1901. He was born in Butler County, O., October 17, 1830, and graduated at Belmont College in 1849. He was admitted to the bar but did not practice, and in 1851 became editor of the *Miami Democrat*. Two years later he established the *Tiffin (Ohio) Tribune*; subsequently he was connected with the *Cleveland Herald*, and *Newark (N. J.) American*, and in 1871 he took the editorship of the *Interior*, an organ of the Presbyterian Church.

GREAT BRITAIN. The United Kingdom of Great Britain and Ireland has an area of 120,979 square miles, and a population in 1901 (see paragraph Census) of 41,454,578, of whom 30,805,466 were in England, 1,720,609 in Wales, 4,471,957 in Scotland, and 4,456,546 in Ireland. The executive power of Great Britain is vested in the king acting under the advice of a ministry nominated by him from the political party in power in Parliament. The main officers of the present Unionist ministry, which has held power since 1895 and was reelected in 1900, are as follows: Prime Minister, Marquis of Salisbury; Lord High Chancellor, Earl of Halsbury; Lord President of Council, Duke of Devonshire; Chancellor of the Exchequer, Sir Michael E. Hicks-Beach, Bart.; Secretary of State, Home Department, Charles Thomson Ritchie; Secretary of State, Foreign Department, Marquis of Lansdowne; Secretary of State, Colonial Department, Joseph Chamberlain; Secretary of State, War Department, Hon. St. John Brodrick; Secretary for Scotland, Lord Balfour of Burleigh; First Lord of the Admiralty, Earl of Selborne; First Lord of the Treasury, Arthur James Balfour; Lord Lieutenant of Ireland, Earl Cadogan; President Board of Agriculture, Robert William Hanbury; Postmaster-General, Marquis of Londonderry. The Church of England is the established church, but all other sects are tolerated.

Census.—By acts of Parliament approved on March 27 and April 9, 1900, the regular decennial census of the United Kingdom was ordered to be taken on March 31, 1901, and it was further directed that the preliminary reports of this census should be completed by August 27, 1901. As stated by the Census Commissioners, these preliminary reports, though not corrected, would probably differ from the corrected reports by so slight a margin as to be entirely negligible, and the preliminary reports are therefore here presented as if final. It appears from them that the total popula-

tion of the United Kingdom on March 31, 1901, was 41,454,578, an increase of 9.9 per cent. since 1801, when the population was 37,732,922. In both cases, however, this population is exclusive of the population of the islands of the British seas, and of sailors, soldiers, and merchantmen abroad. These additional categories amounted in 1891 to about 350,000, but the number was doubtless much larger in 1901, owing to the service of troops in the South African War. The following table shows the population, by decennial periods since 1821, of England, Scotland, Ireland, and Wales, and also of the United Kingdom:

Census Years.	England.	Wales.	Scotland.	Ireland.	United Kingdom.
1821	11,281,883	718,353	2,091,521	6,801,827	20,893,584
1831	13,090,523	806,274	2,364,386	7,767,401	24,028,584
1841	15,002,443	911,705	2,620,184	8,196,597	26,730,929
1851	16,921,888	1,005,721	2,888,742	6,574,278	27,390,629
1861	18,954,444	1,111,780	3,062,294	5,798,967	28,927,485
1871	21,495,131	1,217,135	3,360,018	5,412,377	31,484,661
1881	24,613,926	1,360,513	3,735,573	5,174,836	34,884,848
1891	27,483,490	1,519,035	4,025,647	4,704,750	37,732,922
1901	30,805,466	1,720,609	4,471,957	4,456,546	41,454,578

From this table it is shown that the population of the United Kingdom has doubled since 1821, and that the decennial rate of increase has been fairly constant. But if the rate of increase in each of the four countries is considered separately, it will be seen that the population of England and Wales has increased proportionately more rapidly than that of Scotland, while the population of Ireland shows a large positive decrease in every decade since 1841, when the great famine occurred, the total population amounting in 1901 to hardly more than one-half of the population sixty years previous. The following table shows by per cents. the increase in the population of the United Kingdom since 1821, and also the increase or decrease in each of the four countries, England, Ireland, Scotland, and Wales:

	1821-31	1831-41	1841-51	1851-61	1861-71	1871-81	1881-91	1891-1901
United Kingdom.....	15.0	11.2	2.5	5.6	8.8	10.8	8.2	9.9
England	16.0	14.6	12.8	12.0	13.4	14.5	11.7	12.1
Wales	12.2	13.1	10.3	10.5	9.5	11.8	11.6	13.3
Scotland.....	13.0	10.8	10.2	6.0	9.7	11.2	7.8	11.1
Ireland	14.2	5.5	-19.8	-11.8	-6.7	-4.4	-9.1	-5.3

The decrease in the population of Ireland is seen to be the smallest since 1841, amounting numerically to 248,204. This decrease was almost entirely in the rural districts, the large towns showing on the whole considerable increase. The population of Belfast, for example, increased from 273,079 to 348,965, or 27.8 per cent.; that of Dublin from 269,716 to 286,328, or 6.2 per cent.; that of Cork, from 97,281 to 99,693, or 2.5 per cent.; that of Rathmines and Rathgar from 27,796 to 32,472, or 16.8 per cent., and that of Pembroke from 23,992 to 25,524, or 6.4 per cent. Many of the smaller towns on the other hand reported a considerable loss of population. Of the total population, 74.3 per cent were returned as Roman Catholics; 13.0 per cent as Protestant Episcopalians; 10.0 per cent as Presbyterians, and 1.4 per cent as Methodists. In comparison with the numbers reported under these religions in 1891, there was a decrease among the Catholics of 6.7 per cent.; a decrease of 3.5 among Episcopalians, of 0.3 among Presbyterians, and an increase of 10.4 per cent among Methodists.

As was shown by the previous census, the urban population of England and Wales continues to increase more rapidly than the rural, the increase conforming roughly to the rule that the more populous the city, the higher the rate of growth. In the ten years ending in 1901 the proportionate increase was greatest, not among towns of from 20,000 to 100,000 inhabitants, as was the case in 1881-91, but among cities of from 100,000 to 250,000 inhabitants. By the earlier census towns of more than 250,000 inhabitants showed an increase of 9.28 per cent., but by the census of 1901 the per cent. was 12.48. At the same time towns of from 20,000 to 50,000 showed a lessening increase in population, while among the towns of less than 10,000 there was "on the average a somewhat serious decrease." All told there were in England and Wales, as shown by the census of 1901, 75 towns each containing more than 50,000 inhabitants. The largest twenty of these, their population at the census of 1891 and 1901 and their rate of increase, is as follows:

URBAN DISTRICTS OR TOWNS.	ENUMERATED POPULATION.		Increase per cent.	URBAN DISTRICTS OR TOWNS.	Enumer- ated.	Popula- tion.	Increase per cent.
	1891.	1901.			1891.	1901.	
London.....	4,228,317	4,536,063	7.28	Nottingham.....	213,877	239,753	12.10
Liverpool*.....	629,848	684,947	8.80	Salford.....	198,139	220,966	11.52
Manchester.....	506,398	543,989	7.64	Newcastle-upon-Tyne...	186,300	214,903	15.30
Birmingham.....	478,113	522,182	9.22	Leicester.....	174,624	211,574	21.16
Leeds.....	367,506	428,958	16.72	Portsmouth*.....	159,278	189,160	18.76
Sheffield.....	324,243	380,717	17.42	Bolton*.....	146,487	166,205	14.88
Bristol.....	289,280	328,842	13.68	Cardiff*.....	128,915	164,420	27.54
Bradford*.....	265,728	279,809	5.30	Sunderland*.....	131,686	146,565	11.30
West Ham.....	204,903	267,308	30.46	Oldham.....	131,463	157,288	45.9
Kingston-upon-Hull*..	200,472	240,618	20.03	Croydon.....	102,696	133,886	30.37

* The areas of these towns were extended in the decennial 1891-1901, but in every case the population given for 1891 relates to the population of the town as it would have been if constituted as in 1901.

With the exception of the figures returned for Ireland, the report of the census was in general satisfactory. For the total population, at least of England and Wales, was larger by over 150,000 than had been estimated on the basis of previous decennial increases, and besides this a considerable increase should be allowed over the census figures on account of the troops in South Africa. In general then, the returns showed that the country had not yet reached the "saturation point" as to population, and this alone gave satisfaction in view of the many discussions that had appeared of recent years in the English press as to the increases in wealth and population which could be expected alone of countries of immense area such as the United States and Russia. While again the census returns show that there has been an influx of population to the towns, the figures show also that this tendency has not been so marked as was believed. "Few even of the purely agricultural counties have actually declined. Bedfordshire, Berks, Bucks, Dorset, Somerset, Wilts, and Worcestershire show increases, some of them considerable." Taken broadly, few large areas of the country show any considerable decline in population; the total increase of the country being on the whole uniformly distributed. "Active progress of population has been restricted to little more than four millions of acres out of thirty-seven, and in a measure the face of the country is little changed." It should be noted, however, that one of the most pronounced tendencies shown by the census is the increase of suburban districts. Around many large towns a sort of suburban or semi-rural ring has been formed, whose people are dependent upon the town and yet apart from it. This tendency is shown in the marked growth of several counties. "That of Essex has risen from 578,471 to 816,524; Kent, a little less favored, shows an increase from 807,328 to 936,003; Middlesex which had in 1891 a population of 542,894, returned 792,225; and Surrey shows a rise from 409,115 to 519,522." As shown by the census, the increase in population resulted not from an especially high birth-rate but from a rather low birth-rate, and also a low death-rate. From this fact various deductions were made reaching very different conclusions. The returns of the census in Ireland, while not surprising, were nevertheless distinctly disappointing. While it was well enough to say that the decennial decrease there was the smallest for fifty years, it nevertheless remained true that the more a population in the country had declined, the less it could afford to decline.

Finance.—The revenue for the year ending March 31, 1900, excluding the local taxation accounts, amounted to £119,000,840. The ordinary expenditure amounted to £110,505,000, and the expenditure including war charges aggregated £133,722,000, leaving a deficit for the year of £13,882,000. For the year ending March 31, 1901, the revenue was £130,385,000. The ordinary expenditure for that year amounted to £114,972,000, leaving a surplus of £15,413,000. But the total war charges for the year were £68,620,000, leaving a net deficit of £53,207,000, which was met by the issuing of loans. For the fiscal year ending March, 1902, the total estimates of expenditure were placed by the chancellor of the exchequer at £184,212,000, providing that payments on the sinking fund amounting to £4,640,000 were suspended. The total estimates of ordinary revenue were placed at £132,255,000, or together with other duties which it was proposed to levy, at £143,255,000, thus leaving a deficit of £40,957,000. To supply this deficit, Parliament authorized the issue of loans up to £60,000,000. The total cost of the wars in South Africa and China for the years 1899-1902 were estimated by the chancellor to be £153,317,000. Of this amount, £142,807,000 was for operations in South Africa, £5,660,000 was for operations in China, and £4,850,000 represented interest on the war debt. Of this total amount, £45,271,000 had been or would be provided for by previous surplus, suspension of

the sinking fund, and additional taxation, while loans would aggregate £108,046,000. (See paragraph Customs and Excise Law.)

The National Debt.—On March 31, 1901, the total gross liabilities of Great Britain amounted to £705,723,878, divided as follows: Funded debt, or debt which the government is not obliged to pay within any fixed period, £551,182,153; unfunded debt, representing money borrowed on short time, £67,000,000; terminable annuities, being the present cash value of debt in process of extinction through the payment of annuities, £61,677,469; other capital liabilities, £14,731,256. But from the sum total as thus made up, must be deducted assets amounting to £32,115,676, of which the main items are: Bank balances, £5,596,918, and Suez Canal shares, £25,806,000, leaving the net total debt at £673,608,200. The debt of Great Britain is of long standing, the first loan having been made by Charles II., though this was partially repudiated. The debt was never large, however, until the American Revolutionary War, which cost £121,000,000, and made the debt nearly £250,000,000. This was reduced somewhat up to 1793, when the Napoleonic wars added £600,000,000, and left the total debt in 1816 over £900,000,000. Since then a regular system of repayments has been adopted, and the debt has not been allowed to rise to its former size. During the reign of Queen Victoria, and up to March 31, 1899, the debt was reduced in the sum of £153,000,000; but this amount was almost precisely the cost—£153,317,000—of the South African War and the army operations in China for the three years ending March 31, 1902. Of this cost, £45,271,000 was charged to current revenue, and £108,046,000 raised by loans, neutralizing over two-thirds of all the payments made on the national debt since 1837.

Army.—The total army budget for the last four years has been as follows: For the year ending March 31, 1899, £19,220,500, of which £16,139,800 was for the effective service; for the year 1900, £20,617,200, of which £17,553,000 was for the effective service; for the year 1901, £61,499,400, of which £58,323,400 was for the effective service, and for the year ending March 31, 1902, £87,915,000, of which £83,970,500 was for the effective service.

The following figures show the normal distribution of all ranks of the actual effective service: In Great Britain, 154,333; in Egypt, 5,312; in the Colonies, 43,709, excluding 14,435 native and Colonial troops; and 73,518 in India. (See paragraph Army Reorganization).

Navy.—The total naval estimates of Great Britain for the last four years have been as follows: For the year ending March 31, 1899 (effective service, £21,549,800, non-effective, £2,228,600), £23,778,400; for the year 1900 (effective service, £24,302,000, non-effective, £2,292,500), £26,594,500; for the year 1901 (effective service, £26,476,800, non-effective, £2,315,400), £28,791,900; and for the year ending March 31, 1902 (effective service, £28,603,900, non-effective, £2,271,600), £30,875,500. This steady increase in the naval appropriations was stated by Mr. Arnold Foster, Secretary of the Admiralty, to be necessary in order to maintain the superiority of England's naval force over that of any two foreign powers. There had, the secretary stated, been deplorable delay in the building of ships ordered, but after inquiry it was found that other countries had suffered practically the same delay. It was questioned in the House by the opposition whether the statement still held good that the English naval force was superior to that of any other two countries. France, it was asserted, had 40 battleships completed, or nearly completed, while Russia and Germany had 29 each, and Great Britain had only 66, thus giving to France when combined with Russia or Germany a superiority over Great Britain of three battleships. The secretary, however, declined to change the year's programme for the construction of new vessels, and it was adopted by the House as presented. This programme called for three battleships, six armored cruisers, two third-class cruisers, ten torpedo boat destroyers, five torpedo boats, two sloops and five submarine boats. The personnel of the navy under the new estimates was to consist of a total of 118,635, being an increase of 3,745 over the previous year. With regard to the efficiency of the navy, the secretary stated that there had been struck off from the list of so-called effective ships sixteen vessels, but there still remained on the list a number of ships armed or partially armed with muzzle-loading guns, and that these must remain there until replaced. An excited discussion as to the efficiency of the navy arose from a statement of the Navy League on June 26, 1901, reiterating their statement of October 20, 1900, and showing that (1) the naval programme of late years had been insufficient for England's safety, that (2) these insufficient programmes had been only partially carried out, and that (3) the relative naval strength of Great Britain was being steadily diminished by increase in the naval construction of other nations. "No more dramatic contrast exists," said the League, "than that presented by the actual conditions of the main fighting fleet of Britain and the belief held by the public at large as to their sufficiency and efficiency." "In the Mediterranean, where the battle for empire will probably be fought out," there is a deficiency in all classes of vessels, and a complete absence of fleet auxiliaries of all kinds. So far as the

personnel of the navy is concerned, "the spirit of duty and sacrifice reigns from the top to the bottom of the service." "The defects of the navy are due solely to civilian neglect ashore." And of these defects the chief, according to the Spectator's résumé of the League report, was that "the Lords of the Admiralty are overworked, overwhelmed with detail, have no time to think, and that there is no department corresponding to the German General Staff, where the quality prevision is exercised at leisure and while England is at peace." In the discussion on this manifesto which took place in the House of Commons, the government took the position that although there were only ten British war ships at present in the Mediterranean squadron, of which one was always on the retired list, yet it was absurd to state that in times of peace the British vessels in the Mediterranean should always be equal to the war vessels of any other two European powers. On mobilizing for war, the British Mediterranean fleet could be largely increased, and in any event it was untenable to take the point of view that the Mediterranean constituted a strategical unit by itself. On the first of April, 1901, the effective fighting fleet of Great Britain as compared to the other principal nations was as follows: Great Britain, 45 battleships built and 14 building; Germany, 19 battleships built and 9 building; France, 30 built and 4 building, and Russia, 17 built and 8 building. Cruisers, Great Britain, 129 built and 20 building; Germany, 23 built and 8 building; France, 40 built and 15 building, and Russia, 14 built and 11 building. Besides these, Great Britain had built 17 coast defense vessels, Germany 19, France 14, and Russia 15.

Agriculture.—The general average of production of the staple cereal crops in Great Britain for 1901, except in the case of wheat, was lower than in 1900, and below the average of the ten years preceding. This reduction was shown both in acreage and in average yield per acre, except in the case of wheat, and even in this staple there was a falling off in the number of acres planted. Weather conditions were unfavorable. Scotland maintained a better average in per-acre returns than either England or Wales. The following table shows the officially estimated production of the principal cereals in 1901, as compared to 1900, with a comparison of the yield per acre to the average for the ten years preceding:

WHEAT.	TOTAL AMOUNT PRODUCED.		ACREAGE.		YIELD PER ACRE.		Average Yield— 1891-1900.
	1901.	1900.	1901.	1900.	1901.	1900.	
	<i>Bush.</i>	<i>Bush.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Bush.</i>	<i>Bush.</i>	<i>Bush.</i>
England.....	49,892,667	49,528,385	1,617,721	1,744,556	30.84	28.39	29.91
Wales.....	1,156,673	1,332,299	46,882	51,654	24.67	25.79	24.24
Scotland.....	1,418,262	1,779,125	36,225	48,832	39.15	36.43	37.08
Total.....	52,467,602	52,639,809	1,700,828	1,845,042	30.84	28.53	29.98
BARLEY.							
England.....	49,557,593	50,977,265	1,635,426	1,645,022	30.30	30.99	33.03
Wales.....	3,016,334	3,341,692	101,907	105,048	29.60	31.81	30.26
Scotland.....	8,533,696	7,996,373	235,115	240,195	36.30	33.29	36.79
Total.....	61,107,623	62,315,110	1,972,448	1,990,265	30.96	31.31	33.13
OATS.							
England.....	67,963,053	73,604,178	1,831,740	1,860,513	37.05	39.56	40.38
Wales.....	6,490,336	7,238,305	208,773	216,447	31.09	33.44	33.18
Scotland.....	36,762,141	34,005,054	956,389	949,128	37.38	35.38	36.19
Total.....	110,105,530	114,847,537	2,996,902	3,026,088	36.74	37.95	36.47

In contrast to the decline of acreage in cereal crops, the areas under orchards have steadily increased from 224,116 acres in 1897 to 234,660 in 1901. The number of acres under clover and rotation grasses for 1901 was 4,856,387, and under permanent pasturage 16,827,249, as compared with 4,759,158 and 16,729,035 for 1900.

Mineral Production.—Definite statistics as to the production of coal in Great Britain in 1901 are not available owing to the difficulty of obtaining figures on the home consumption. But the most reliable official estimate stated the total as nearly 225,000,000 tons, the figure for 1900. The export in 1901 was 43,766,552 tons, as against 46,098,228 tons in 1900. Of the 1901 total of exports, 808,061 tons were in the form of coke, 1,080,146 tons briquettes, and 41,878,345 tons ordinary export coal. The falling off in the amount of export was due to the imposition of a coal export tax of a shilling a ton, and the relative smallness of the decrease is explained by the fact that certain concessions were made to the shippers. In December, 1901, the government appointed a royal commission to investigate the coal supply of Great

Britain. Mining wages declined considerably during 1901, in sympathy with the fall in the price of the mined product. In Wales, where the automatic sliding scale prevails, wages fell 8 per cent. with every fall in price of one shilling a ton. Taking this as a basis, and considering that the price of export coal fell from 16.51 shillings per ton in 1900, to 13.91 shillings in 1901, it would be fair to say that there was a reduction of 20 per cent. from the scale of 1900.

Speaking broadly, the iron and steel trade of Great Britain in 1901 suffered in imports of ore, in exports of iron and steel, and in the amount of finished product. The imports of ore, which came from twenty different countries, amounted to 5,546,845 tons, being a decrease from 1900 of 751,118 tons, or 12 per cent. The price of ore in November was 15.25 shillings per ton, against last year's average of 14.67 shillings per ton. The value and amount of the finished iron and steel and machinery imported into Great Britain was £10,259,056 for 923,677 tons, against £9,284,436 for 799,674 tons in 1900. The early part of the year saw a revival in the manufacture, due to the decline of wages, railway charges, and the price of coke, but it fell off again. The exports of iron and steel of every kind amounted to 2,900,100 tons, of a total value of £25,305,673, a decrease from 1900 of 640,589 tons, of a value of £1,687,002. These exports were made up of 839,223 tons of pig iron, 574,656 tons of rails, and 1,486,221 of machinery and other forms. The total production of iron and steel was 8,200,000 tons, representing a decrease from 1900 of 708,570 tons. Most of the decrease was in steel. The iron ore lifted was about the same in quantity as in 1900, that is, slightly over 14,000,000 tons. One significant fact in connection with the export trade in iron and steel is that in 1901 practically nothing was sent to Germany, one of Great Britain's best customer before. On the other hand, Germany actually shipped some thousands of tons of iron ore to Great Britain.

Ship-Building.—The total number of steamships and sailing vessels of the world of 100 tons register and over was estimated by Lloyd's Register for 1901 at 29,091, and their total tonnage at about 30,600,510. Of this total the United Kingdom had 13,656,161 tons, and the colonies, 1,052,045, giving a total British tonnage of 14,708,206. The United States came next to Great Britain in the aggregate amount of their shipping tonnage, having 3,077,344 tons, and Germany followed with 2,905,782 tons. But if the steamships alone of the world were considered, the United States fell to third place; the total estimated steam tonnage in the world being 24,008,883 tons, of which the United Kingdom, together with her colonies possesses 12,739,180, Germany 2,417,410, and the United States, 1,704,156. During 1900, 692 ships with a tonnage of 1,442,471 were launched in the United Kingdom, of which 28 were sailing vessels with a tonnage of 9,871. In addition to this, there were launched 29 warships with 68,364 tons displacement, of which 20 vessels with a tonnage of 35,050 were for the British government. Of the total construction in the United Kingdom in 1900, 1,109,165 tons, or nearly 77 per cent. were intended for the trade of the United Kingdom. Of the remaining vessels, Germany supplied the largest number of orders, aggregating 103,625 tons; Austria-Hungary followed with orders for 80,426 tons; Holland, for 24,403 tons; France, for 21,034 tons, and Spain for 19,038 tons. The net increase in the tonnage constructed in Great Britain in 1900 over that of 1899 was about 220,000. According to a writer in the *Financial Review*, there were 680 vessels built in 1901 with an aggregate tonnage of 1,736,708 tons, of which 41 vessels with a displacement of 211,969 tons were warships. On the other hand, it is expected that shipbuilding for the year 1902 will show a large decrease, and an indication of this and of the present glut in the shipping market is shown by the fact that freights had fallen by the end of the year so that they were hardly more than half what they had been in 1900.

Trade and Commerce.—The trade of Great Britain for the year 1901 was on the whole satisfactory, especially when it is considered that industrial conditions in Europe were gravely disturbed, thus tending to reduce England's export trade, while the continuance of the South African War and the large government loans necessitated by it reduced the amount of capital in the country available for mercantile transactions. The exports for the year were £280,498,889, a decline of £10,673,107 from 1900. The imports also showed a slight decrease, their total value in 1901 being £522,238,986, a decline during the year of £836,177. The largest declines in exports were in raw materials, principally coal, the total decline in raw materials being £8,501,365. Manufactures of metals also showed the large decrease of £5,933,147 from the preceding year. On the other hand, articles of food and drink were exported to a value exceeding by £1,263,160 the total values of 1900. Probably the most interesting feature of the year in manufactures was that connected with the coal situation. Owing largely doubtless to the South African War and the extraordinary demand for coal both for the transports in the government service and for domestic industries manufacturing materials of war, the price of coal rose so high in the latter part of 1899 and in 1900 as seriously to handicap general manufactures. It was also alleged that the coal dealers were taking advantage of the necessities of the

government to coin excessive profits at the expense of the country. For this season, the shilling export tax on coal advocated by the chancellor of the exchequer and sanctioned by Parliament (see paragraph Customs and Excise Taxes) met with very general approval throughout the country, although the coal dealers complained bitterly that they could not export coal at a profit under it. Nevertheless events proved that the export tax did not seriously interfere with coal exports, the lessened exports for 1901 being readily accounted for by the lessened ability of Europe to buy coal during the year. On the other hand, the fall in domestic prices of coal caused by the export tax tended to stimulate increased production in industries where the price of the products depended largely upon the cost of fuel. The iron and steel industries during the year were hardly satisfactory. Exports of iron and steel of every kind for the year amounted to 2,900,100 tons, showing a falling off from the previous year of 640,589 tons, with a decline of value of £6,687,002. As regards finance, the great interest of the year in Great Britain centred around the borrowings of the British government for purposes of the South African War. In February, £11,000,000 of 3 per cent. bonds were negotiated and in April, an issue of £60,000,000 was made. These bonds were all heavily over-subscribed, although the price of consols fell to 92, whereas it had been 114 before the war. At the same time that the British consols fell, the stocks of several of the largest British railways fell also. This was partially owing no doubt to the fact that so much of the country's capital was being tied up directly or indirectly in industries connected with the war, and partly also to the fact that on account of the increase in the price of coal and materials, the British railways were forced to cut their dividends heavily. How heavily some of the largest railway stocks declined may be seen from the fact that London and North Western fell from 180 to 158, North Eastern, from 172 to 149, Great Western, from 169 to 131, and Lancashire and Yorkshire, from 132 to 104. Notwithstanding these declines, however, both in consols and in railway stocks, which have habitually been looked upon as most stable investments, financial conditions in England were very little disturbed throughout the year, and there was no stringency in the money market.

In the following table are given the total exports and imports of Great Britain for the calendar year 1901 and also the decrease or increase of each class of exports or imports from the preceding year. This table has been compiled from the returns made by the British Board of Trade.

IMPORTS FROM FOREIGN COUNTRIES AND BRITISH POSSESSIONS, 1901.

	Value.	Increase over 1900.	Decrease from 1900.
I. Animals, living, for food.....	£ 9,400,083		£222,286
II. A—Articles of food and drink, duty free.....	162,949,666	£8,869,578	
B—Articles of food and drink, dutiable.....	47,596,501		1,636,028
Tobacco, dutiable.....	4,819,473	20,066	
III. Metals.....	30,787,462		2,407,939
IV. Chemicals, dye-stuffs, and tanning substances.....	6,129,559	568,766	
V. Oils.....	11,030,606		2,714
VI. Raw materials for textile manufacturers.....	79,401,772	2,064,409	
VII. Raw materials for sundry industries and manufactures.....	57,964,510		7,126,181
VIII. Manufactured articles.....	93,609,764	384,749	
IX. A—Miscellaneous articles.....	17,298,198	526,577	
B—Parcels post.....	1,262,462	142,836	
Total value.....	£522,238,986		£286,177

EXPORTS OF BRITISH AND IRISH PRODUCE AND MANUFACTURES, 1901.

	Value.	Increase over 1900.	Decrease from 1900.
I. Animals, living.....	£ 742,499		£ 159,344
II. Articles of food and drink.....	14,884,915	£1,263,160	
III. Raw materials.....	33,377,644		8,501,365
IV. Articles manufactured or partly manufactured.....			
A—Yarns and textile fabrics.....	103,471,561	1,259,161	
B—Metals, manufactures of (except machinery and ships).....	39,413,762		5,933,147
C—Machinery and mill work.....	17,856,336		1,764,449
D—Ships, new (not registered as British).....	9,159,876	572,166	
E—Apparel and articles of personal use.....	10,940,060	545,860	
F—Chemical and drugs.....	8,942,109		320,210
G—Manufactured or partly manufactured articles.....	38,068,750	1,654,692	
H—Parcels post.....	3,642,369	690,569	
Total value.....	£280,498,889		£10,693,107

EXPORTS OF FOREIGN AND COLONIAL MERCHANDISE, 1901.

Total	667,846,843
Increase	4,665,085

The following table shows for ten years the imports, exports, and total commerce of Great Britain and the United States:

YEAR.	*Imports of Great Britain	Imports of the United States	†Exports of Great Britain	†Exports of the United States	‡Total Commerce of Great Britain	‡Total Commerce of the United States
1891 ..	\$1,000,122,000	\$84 186	\$1,105,888,000	\$220,297,315	\$2,421,302,079	\$1,779,351,615
1892 ..	1,000,212,000	77 184	1,083,043,000	224,739,454	2,317,787,496	1,842,387,708
1893 ..	1,007,007,000	87 141	1,061,086,000	227,116,116	2,319,247,874	1,801,418,169
1894 ..	1,007,614,000	80 147	1,110,339,000	1 115	2,418,472,300	1,020,629,483
1895 ..	1,148,842,000	88 166	1,108,660,000	1 180	2,601,802,702	1,007,416,797
1897 ..	2,104,707,000	74 189	1,139,715,000	1,1 190	2,620,156,174	1,042,304,274
1898 ..	2,100,000,000	88 146	1,138,828,000	1,1 140	2,719,634,280	1,000,610,784
1899 ..	2,380,380,000	79 110	1,207,640,000	1,1 144	2,964,601,264	2,074,436,381
1900 ..	2,448,288,000	82 197	1,418,198,000	1,1 189	2,904,648,579	2,308,900,000
1901 ..	2,541,476,025	88 206	1,808,047,848	1,1 119	2,008,829,889	2,346,801,976

*The figures given for the imports and exports of Great Britain are calculated only in round numbers and may each vary from the correct amount to a maximum of \$2,000, but the variation is usually considerably less. The figures for the total commerce of Great Britain are believed to be exact.

†The figures given for exports do not include the exports of merchandise produced outside of the country, that is, merchandise which has been imported to the country and is then re-shipped and exported. In the case of Great Britain the amount of merchandise so re-shipped has averaged yearly since 1880 nearly \$300,000,000. In the case of the United States re-shipped merchandise has increased by fairly equal amounts from \$12,000,000 in 1880 to \$25,000,000 in 1900.

‡The figures given for total commerce are found by adding together the figures for imports and exports, but the exports are here taken to include both the exports of merchandise of domestic production and the exports of merchandise of foreign production, that is, both true exports and re-shipments.

The question of German, and more especially, of American competition with British manufactures which was first seriously considered in 1900 was discussed with no less interest in 1901. Notwithstanding the fact that the total commerce of Great Britain, with a population hardly more than half that of the United States, and a country incomparably inferior to the United States in natural resources, enjoys nearly double the total commerce of the United States, there were loud complaints in the English press during the year to the effect, not merely that Great Britain's commercial supremacy would be taken from her, but that it had already been taken from her, and that Great Britain must henceforth follow the industrial lead of other nations. That Great Britain can no longer produce either coal or steel and iron manufactures to the extent of those produced in the United States and that her exports of these articles must fall behind those of the United States may be readily admitted; but that any marked decadence is shown in British industries taken as a whole was seriously questioned by many. On the other hand, it was nowhere denied that both British employers and employees might in several particulars copy American patterns with great advantage to themselves; for from a long array of undisputed facts, it appears that labor in England is sadly lacking in mobility, and capital in initiative. Owing largely to the fact that workmen in Great Britain are minutely subdivided in trades and trade unions and that each trade union has very strict regulations for the admission of apprentices and the government of journeymen, English laborers find it very difficult to shift from one kind of work to another. A sort of caste system appears to be the foundation of the whole industrial situation; so that each man, finding it of extreme difficulty to force an entrance into any other trade than that in which he has been bred, demands that his particular kind of work in any trade shall not be curtailed. Therefore, the laborer bitterly resents the introduction of labor-saving machines which tend to destroy any subdivision of manual labor in a particular trade or to diminish the number of workmen required in that particular subdivision. Acting upon the principle that there is just about so much work to do and so many men to do it, the laborer opposes any addition to production per capita. That is to say, while in the United States the unions insist only that wages shall not be cut below a certain point, but concede that more work will be done if the wages are correspondingly raised, the British workman only demands a minimum wage and will not allow his fellow workmen to receive more money for more work done. Similarly, there seems to be no doubt that while the workmen have in many cases dissuaded employers from introducing labor-saving machines, the British employer himself looks with a certain fondness upon the antiquated instruments of production which his father or grandfather used, and is loth to throw them away. The

principle adopted in all large American industrial establishments that no matter how expensive the present machinery is, other machinery must at once be substituted if it will pay a higher return on the capital invested, is not readily conceded in Great Britain. All told, however, there is stated by many writers to be something ridiculous both in the complaints made by Great Britain that its commercial victories have departed from it, as well as in the boasts of some American writers that Great Britain may no longer be considered as a serious obstacle to the progress of American industries abroad.

As in previous years, much comment was excited in the United States by the fact that British imports were so vastly in excess of British exports. How could a nation, it was asked, continually buy when it does not sell without eventually going into bankruptcy? While this question was not satisfactorily answered, it might be stated as a partial explanation to which measure many similar facts could be added that the capital in London alone employed in foreign banking enterprises in the East approximates £200,000,000.

HISTORY.

Parliament.—The first session of the 27th Parliament (an extra session) met on December 3, 1900, in order to vote the government further supplies for the prosecution of the war. It then adjourned on December 14 until February 14, 1901, but was reconvened on January 23, 1901, on the demise of the Queen, in pursuance of the law requiring Parliament to meet immediately on the death of the sovereign. Members of both Houses took the oath of allegiance to the new sovereign on January 24, and on January 25, a message having been received from King Edward announcing the Queen's death, a message of condolence was voted by Parliament. Adjournment was then taken until February 14, when the King, accompanied by Queen Alexandra, journeyed in pageant form from Buckingham Palace to Westminster and opened Parliament in person. In the message from the throne, the King stated that the cessation by the Boers of the guerrilla warfare which they were maintaining would be as much to their own interests as to Great Britain's, as until that time it would be impossible to establish in the South African colonies institutions securing equal rights to all the white inhabitants and protection and justice to the native population. The King stated that, notwithstanding the death of the Queen, the establishment of the Australian Commonwealth would be commemorated by the opening of its first Parliament by the Duke of Cornwall and York. With regard to new legislation, the Crown stated that bills would be laid before Parliament for regulating the voluntary sale of land to tenants in Ireland, for amending and consolidating the factory and workshop acts, for amending the law relating to education, and the public health acts, and for the prevention of drunkenness. With reference to the new civil list which the demise of the Crown made necessary, the King announced that he unreservedly relinquished his hereditary revenues as had his predecessor, Queen Victoria. The session of 1901 was very similar to that of 1900, in that it consisted largely of discussions upon the Boer War and of collateral questions arising therefrom, including the question of the best means of defraying the war expenses. In so far, however, as concerned measures of domestic reform, the session was disappointing, few acts of importance being passed. The opposition as a party showed even less coherence than in the previous session. On the other hand, the Conservatives showed such extraordinary negligence that on several occasions their majority was unpleasantly reduced, and on the voting of an amendment to the consolidated factory law, they were openly defeated. Besides the civil list act, the voting of supplies for the army and navy and the army reorganization bill, which are treated in separate paragraphs, the measures which appeared to occupy the greatest amount of time were those connected with royalty and the approaching coronation. After the opening of Parliament, a letter signed by thirty Catholic peers was presented, praying that the King's declaration, in which he was required, by existing law, to stigmatize as "idolatrous and superstitious" the belief of his twelve million Catholic subjects might be in some way modified. Committees were appointed to this end by both Houses, and various amendments were proposed in order that the King, while still unequivocally asserting his position as head of the established church, might yet not give offense to those of a contrary belief. But to the proposed amendments the established church objected that they did not sufficiently safeguard the Protestants, while at the same time the Catholics maintained that the offensiveness of the declaration was not removed. And in the end the declaration was allowed to remain as before. An act receiving royal approval on August 17 permitted the King to alter his royal title in his own discretion, so as to give recognition to his British possessions beyond the seas. In accordance with this act, King Edward adopted a complete title, as follows: "Edward VII., by the Grace of God of the United Kingdom of Great Britain and Ireland, and the British Dominions beyond the Seas, King, Defender of the Faith, Emperor of India." Other events of the

EDWARD VII.

QUEEN ALEXANDRA.

session were the trial of Lord Russell in the House of Lords on a charge of bigamy; the heaping of honors upon Alfred Milner (*q.v.*), and the donation to Lord Roberts, the commander-in-chief of the army, of £100,000 for his services during the South African War, although the South African War showed no symptoms of completion. The discussions rising out of the session as regards the Irish and Liberal parties, as well as the measures passed, will be found in succeeding paragraphs. In proroguing Parliament on August 17, the King regretted the continuance of the South African War; stated that the enthusiastic reception that had been accorded the Duke and Duchess of York in every colony they had visited was an additional proof of the patriotism, loyalty and devotion of the people of his dominions over the sea, and felicitated Parliament on its liberal provision for the naval and military service, for the maintenance of the dignity of the Crown, and for authorizing the King to make such additions to his title as he deemed proper. See EDWARD VII. and VICTORIA.

The Liberal Party.—The Parliamentary session of 1901 (see paragraph Parliament) was admitted even by its friends to have been exceptionally lame in results, and at least a partial cause of this was ascribed to the fact that the Liberal opposition had shown itself during the session to be powerless either in forcing the government to initiate new measures or to amend measures that had once been proposed. In fact, as was commonly stated, the basis of government by Parliament required an effective opposition, and lacking this, no party in power could be held to its duty. While the Liberals did not agree that their present disunited and disorganized condition was responsible for the small amount of effective legislation enacted by Parliament, they did generally agree that some means should be taken to draw the Liberal party into a more effective union and to enunciate some principle upon which the various segments of the party could stand upon a common footing. At a meeting of the Reform Club on June 14, conciliatory speeches were made by the leaders of the party, and a vote of confidence was passed in Sir Henry Campbell-Bannerman, the Liberal leader. But in a letter on July 16 and in a speech on July 19, Lord Rosebery (*q.v.*), premier of the Liberal government in 1895, derided the conciliatory efforts made at the Reform Club and termed the whole meeting a manifestation of "organized hypocrisy." There could be no peace, he said, within the party, and no effective action by it until an agreement was reached in the matter of the war and the maintenance of the empire. The Liberal leaders had concluded that this was a transient subject on which they might agree to disagree. Fox also had thought the issue unessential when he opposed the great war with France. "But in spite of his vast abilities and uncreditable charm, he split his party and excluded it from power for nearly forty years." The truth was that statesmen who disassociated themselves from the nation in such a national question as war, where all strove and suffered together, disassociated themselves for much longer than they thought. The issue was in fact supremacy calculated to create new parties, much more to destroy an old one. For himself, Lord Rosebery said, he equally approved the purpose and condemned the methods of the war. No impartial observer remembered any government which had carried into its administration such a frightful assemblage of error, weakness, and wholesale blunderings as had the present Conservative one. But until the Liberals determined definitely for or against the empire, of which there seemed no immediate prospect, a weak government was likely to be confronted by a weaker opposition.

This manifesto of Lord Rosebery's, for it could not be considered less, met with an immediate approval from the stronger portion of the press in so far at least as the speech purported to give an accurate description of the existing status of the two parties. But it was pointed out that if Lord Rosebery himself had never said a foolish thing, he had rarely done a wise one, and that his baiting of his own party without at the same time offering any cure for the disease he had diagnosed, would do not the slightest good. Nevertheless, the speech produced a strong impression in English political circles, and its effect was heightened by a supplementary speech delivered by Lord Rosebery on December 16 at Chesterfield. Lord Rosebery there said that the truth of the remarks he had made in July had been pretty well proven in the intervening months. For there had been no diminution in the meantime, but rather an accentuation throughout the British Isles of the sentiment comprehended by the one word "empire"; and whoever now disassociated himself from this sentiment should not be surprised if the nation disassociated itself from him. As to the minor pieces of advice which he had given the Liberals in July, time had also dealt gently with them. The hope persisted in by some Liberals that they might continue the nominal alliance initiated by Mr. Gladstone with the Irish Nationalists, had been finally dissipated by the action of the Irish themselves who had repeatedly that year in Parliament repudiated any connection with the Liberals, and had indeed ranged themselves definitely with the enemies of the empire. (See paragraph Irish Representation in Parliament.) And finally the brilliant opportunity which Lord Rosebery said, in July, was offered to the Liberal party, of espousing the present foreign policy of the Conservatives, but at the same time, freeing that policy from its gross mis-

management, had also been proven true in so far at least as the Conservatives had done nothing to increase their efficiency. Finally, the Conservative Parliament which adjourned in August had put hardly one useful domestic measure upon the statute books, and the great problems of temperance, housing the poor, and instituting a coherent national system of education remained still to be solved.

In commenting upon this speech of Lord Rosebery's, as well as upon his previous one, the press was inclined to take the attitude that while in the main Lord Rosebery's statements were correct, he had not yet offered to do the only thing of practical use, which was to offer himself as leader of his party. The present leader, Sir Henry Campbell-Bannerman, showed no inclination to resign, and Lord Rosebery apparently showed an even less inclination to attract a personal following. Moreover, as the press pointed out, a party in power always considered itself to be singularly efficient in administration, while naturally, and indeed necessarily, a party out of power claimed that it alone could save the country. As for Lord Rosebery's idea of solving the educational problem, housing the poor, and reforming the liquor trade, those things, remarked the *London Times*, were all very well in their time and season, but the main business on hand was the termination of the South African War. At the end of the year, the various divisions of the Liberals; those opposed to the war, led by Mr. James Bryce and Mr. John Morley; those more or less divided on the subject, led by Sir Henry Campbell-Bannerman; and those in favor of the war, led by Lord Rosebery, were still at odds; and the Irish Nationalists were definitely pressing disparate ends of their own. The one fact upon which all agreed was that the continuance of the war seriously weakened Great Britain's financial and commercial strength, guaranteed a more embittered final settlement in South Africa, and forced Great Britain to take an inferior position in international politics very different from that which she had been accustomed to occupy.

Irish Measures and Representatives.—One of the most pronounced features of the 1901 session of Parliament was the reappearance of a united Irish party under the leadership of Mr. John Redmond, intent upon gaining what they considered necessary reforms for Ireland, or, failing in that, of obstructing the legislative measures of the government. The active campaign of this party appeared to begin with the accession of King Edward to the throne; the Irish leaders maintaining that while they had owed a limited amount of allegiance to the Queen in her personal capacity, they owed no allegiance whatsoever to the King personally or officially, and did not intend to give it. As far as the acts of the Irish party in Parliament were concerned, critics of the government seemed to think that the exercise of a little more tact by Mr. Balfour, leader of the House, would have avoided much consequent trouble; but Mr. Balfour, it appeared, was extraordinarily fond of the closure, and whenever the Irish insisted on what they called their rights, they were at once blanketed by the ordering of the vote. As a matter of fact, as pointed out in December, 1901, by Lord Rosebery, 76 per cent. of all the supplies voted during the session were voted for under the closure, and this alone signified it was stated an improper tendency to restrict free speech on the part of the government. On the ordering of one of these closures on March 5, when a member of the Irish party arose to speak, a scene was raised that caused widespread excitement as well as the subsequent arrest of several of the Irish representatives. On this occasion several of the Irish members refused to go to their division lobby to vote as required under the rules. And when the deputy sergeant-at-arms endeavored to compel them to do so, they still resisted and the police were called in to arrest them. On March 7, the Ministerialists retaliated for this disturbance by changing the standing rules of the House so that members who refused to obey the speaker might be suspended from the service of the House for the remainder of the session. It was scarcely two months after this, on May 9, that by order of the Imperial government, the *Irish People* was seized in Dublin for printing what was described as a "gross, outrageous, scandalous, false and loathsome" libel upon his Majesty the King. In objecting to the seizure, Mr. John Redmond stated that the action of the Imperial government was inspired from the fact that the *Irish People* was the organ of the united Irish League, and that much stronger personal attacks had frequently been made by English papers upon the late Queen and the royal family without any unfavorable comment by the government. But upon a division as to the propriety of the seizure, the Irish party were defeated by 252 to 64 votes.

The reasons for the hostile attitude of the Irish in Parliament may perhaps be best shown by the measures on behalf of Ireland which they endeavored to have passed. The first was a motion to the effect that taxation in Ireland was steadily increasing, notwithstanding that the population was steadily decreasing, and that reductions in the taxes should therefore be made. (See paragraph Census.) To this the administration replied that out of every 21 shillings in taxes raised in the United Kingdom, Ireland contributed only 1 shilling 5 pence. Another motion was for the institution of a system of compulsory sale of lands by English landlords to their Irish

tenants instead of, as at present, a voluntary system of sale and purchase. To this the government answered that while land purchase by tenants should be encouraged in every way possible, it must be kept voluntary, as otherwise the Irish might repudiate their obligations on the recommendation of the Irish leaders. Another Irish motion was for the establishment of a Roman Catholic University in Ireland, so that the Irish would be given facilities for university education without having violence done to their religious feeling. To this proposal, Mr. Balfour said he was willing to give his personal assent, but the matter nevertheless was left pending. The final proposal of the Irish party was that the existing railway rates in Ireland constituted an intolerable grievance, and that the railroads should be either managed or purchased by the state so as to reduce the tariffs, and that certain waterways and rivers should be made navigable so as to increase facilities of transportation. As against this motion an amendment was carried, stating as the sense of the House "that while admitting the importance of developing the facilities of transit in Ireland, the time is not opportune for taking any steps which might act as a check to private enterprises and place a burden upon the public funds." Besides the really important measures which the Irish proposed there were others of less moment, but which were perhaps even more vexing to Englishmen. For example, on August 13, Mr. William Redmond objected to the historical title of the sovereign as "defender of the faith" on the ground that these words had applied originally to the Roman Catholic faith and that they were now "obsolete and absurd." But Mr. Balfour, as stated by an English paper, "met this ridiculous contention with some observations which were quite conclusive." In summing up all the trouble which the Irish had given Parliament during the session, the *London Times* on August 14 found, however, one consolatory fact, though it was probably not consolatory to the Irish League; and that was that "though the Irish members were peculiarly active and aggressive during the session, they extorted no legislation from the government."

After the session adjourned, the campaign of the Irish party still continued. Mr. John Redmond sailed for the United States with the apparent aim of enlisting money in the Irish cause, and in the fall there was elected to Parliament from the constituency of Galway in Ireland a Mr. Arthur Lynch who, if he had not been actually enlisted in the Boer army, as he claimed prior to his election, was at least an avowed sympathizer of the Boer cause. All these things tended to keep the question of the attitude of the Irish prominent and to destroy at least for the present any hope of a larger measure of home rule for Ireland. For as Lord Salisbury remarked, "If home rule had passed in 1893, what would England's position . . . have been to-day? We know now from our South African experience the danger of letting Ireland have a measure of independence. We know now that if we allowed those who are leading Irish politics unlimited power of making preparations against us, we should have to begin by conquering Ireland, if we ever had to fight any other Power."

Irish Representation in Parliament.—The pronounced, if acrid, ability to annoy the government displayed by the group of Irish nationalists in Parliament gave rise to the demand on the part of the English press that Ireland's representation in Parliament should be reduced proportionately to her population. From statistics brought forward by the *London Times*, it appeared that English representatives in Parliament were returned by an average of 10,897 electors each, Scotch representatives of 9,678, and Irish by only 7,144. Or, if the whole number of electors in the United Kingdom was divided by the total number of representatives and an average struck of electors to each representative, it would be found that England had 34 too few electors, Scotland 3 too many and Ireland 31 too many. While it was admitted that there were also anomalies in parliamentary representation as based on population in some of the constituencies of England and Scotland as well as in Ireland, it was alleged that the most glaring instances of over-representation were found in Ireland, and that the action of the Irish members themselves had proven that it was time to curtail the privileges they abused and to reduce Irish members to a just proportion with the population, intelligence, and wealth they represented. Moreover, as the *Spectator* pointed out, since two wrongs never made a right, the existing state of affairs could not be excused by saying that formerly Ireland had been as much under-represented as she was at present over-represented. In further advocacy of the reduction of the number of Irish members it was alleged that the Irish members were simply playing the part of obstructionists, and that the small parliamentary legislative record for the year was largely due to their persistent perversity. Mr. John Redmond, however, who objected to this statement, said that the truth was that as Parliament virtually acted as a local legislature for the counties and parishes of England, Ireland, Scotland, and Wales, attending to their petitions and composing their village frets, it had as a matter of course but little time left in which to enact legislation affecting the Empire as a whole. And Mr. Redmond added that Irish obstructionism was clearly fictitious, as Mr. Balfour on behalf of the English made immediate use of the closure when the Irish entered into the parliamentary debates.

Tour of Heir Apparent.—The tour of the Duke and Duchess of Cornwall and York to the principal colonies of the British Empire, extending from March 16 to November 1, 1901, excited much attention in England and served to reassure Englishmen as to the solidarity of the Empire at a time when such assurance was especially grateful to them. For all during the year unfavorable comments in Europe, and more especially in Germany, were continued, condemning both the initiation and the method of prosecution of the Boer War and expressing a pleasure at the many if not serious reverses to the British arms. As offsetting these sentiments expressed in unwearied Continental editorials and cartoons, Englishmen learned with pleasure that the Duke and Duchess of Cornwall had been received everywhere with lavish official hospitality, and assurances of the continued loyalty of the colonies. The Duke's trip was made ostensibly to open the first Parliament of Australia in accordance with arrangements made by Queen Victoria before her death. After having performed this duty on May 9 at Melbourne and having previously stopped at Malta, the Island of Ceylon, the Straits Settlements, and other British possessions, the Prince visited New Zealand, the island of Tasmania, and Cape Town, and from there sailed to Canada, arriving at Quebec on September 16, and journeying through the Dominion to Victoria and Vancouver on the Pacific Ocean. The Duke reached Portsmouth on November 1, after having traveled over 45,000 miles without having once set foot, except at Port Said, on any land where the Union Jack did not fly. In commenting upon his trip at a dinner given him by the London Corporation at the Guildhall on December 5, the Duke stated that the most impressive lesson of his tour was the loyalty everywhere manifested by the colonies and brought about both by the personal devotion everywhere felt for the late Queen and to the wise colonial policy which England had pursued for the last half century. Mr. Chamberlain, following out the same thought as to the importance of the loyalty of the colonies, stated that it was a matter of extreme significance that during the war, the Dominion of Canada and the states of Australia had between them sent an army of 18,000 men to South Africa and 50,000 more had been raised in South Africa itself. The underlying suggestion of Mr. Chamberlain that the military forces of Great Britain united with those of the colonies would allow Great Britain to be independent of the criticisms and animosities of the Continent, was generally approved by the English press. Certain critics, however, pointed out that the South African War was intrinsically a small affair, and that judged by modern armaments 18,000 men was an essentially small contingent. Australia and Canada were the principal, if not the only, colonies upon whom Great Britain could make levies for troops in case of a really serious war. But in such event not 18,000 troops, but ten times that number, would be required to compensate Great Britain for the loss of even an insignificant Continental ally.

Customs and Excise Law.—In presenting the budget proposals to the House of Commons on April 18, 1901, Sir Michael Hicks-Beach stated that the South African war taken in conjunction with the operations in China had already cost £153,000,000, or twice what the Crimean war cost (see paragraph Finance). For the fiscal year ending March 31, 1902, he estimated the expenditures at £184,212,000, providing that payments on the sinking funds were suspended, and the revenue at £132,255,000, thus leaving a deficit of £50,707,000. To raise the entire amount of this deficit by loans and so shunt the present burdens of the Empire upon the future generation, the chancellor would not agree to, and instead he proposed additional taxation to the amount of £11,000,000 annually. Of this £11,000,000 he estimated that an increase in the income tax from 1s. to 1s. 2d. on the £ would produce £4,700,000; duties on sugar, molasses and glucose would bring the amount up to £8,900,000, and an export duty of 1s. a ton on coal would add the remaining £2,100,000 required. Of the chancellor's proposals, that laying an expert duty on coal met with special opposition. It was argued that owing to the narrow differences of prices in the coal trade of the world, this duty would allow German and American coal to compete in Europe and other countries with English coal; and that thereby, through lessened exports, both the mining industry and the shipping industry which depended to a considerable extent upon it would be seriously affected. The amount of the injury, it was added, might be estimated from the fact that in 1900 the total value of the export coal was about £67,600,000. Notwithstanding these protests, however, the ministry adhered to their proposals. Sir Michael Hicks-Beach intimated that he would sooner resign his office than relinquish them, and the ministry in general contended that inasmuch as Germany imported twice as much coal as she exported, and as the United States in 1900 exported only 7,917,000 tons of coal, of which two-thirds went to British North America, the English foreign trade was in no immediate danger, and in any event if the shilling export duty lowered the price of domestic coal and reduced somewhat the extravagant profits of mine owners, at least manufacturing industries at home would be benefited through the possibility of producing more cheaply.

As approved on July 26, the Customs and Excise Bill provided that the 6d. import

duty on tea per pound should be continued; that an import duty should be laid on sugar of from 4s. 2d. to 2s. per hundredweight, depending upon the polarization test; that an import duty should be laid on molasses of from 2s. 9d. to 1s. per hundredweight, depending on quality, and also a duty on glucose of from 2s. 9d. to 2s. The bill further provided that the additional custom duties on tobacco, beer and spirits imposed by the act of 1900 should be continued; that an excise duty on glucose should be imposed; that the suspension of the new sinking fund and the suspension of payments on account of terminable annuities should be continued; that an income tax of 1s. 2d. on the pound sterling should be levied, to date from April 6; and that there should be an export duty of 1s. a ton on coal, to date back from April 19; provided, however, that the treasury might in its discretion remit the duty on coal exported before January, 1902, but contracted for before April 19, 1901.

Civil List Act.—The death of the Queen having rendered it necessary to make new provisions for the Civil List, King Edward relinquished, as did Queen Victoria at the beginning of her reign, the hereditary revenues of the Crown, now part of the consolidated fund, and Parliament made the following provisions for the royal family by an act approved July 2, 1901: The Duke of Cornwall and York was allotted £20,000 annually; the Duchess, £10,000, with a provision for £30,000 in event of the death of the Duke; each of the King's daughters were allotted £18,000 annually, and the Queen was allotted £70,000 in the event of the death of the King. The total payments and schedules under the civil list as passed amounted to £470,000 annually, distributed as follows: Their Majesties' privy purse, £110,000; his Majesty's household and retired allowances, £125,800; expenses of his Majesty's household, £193,000; works, £20,000; royal bounty, £13,200; unappropriated, £8,000.

Government Cordite Contracts.—The vehement criticisms directed against Mr. Joseph Chamberlain at the extraordinary session of Parliament which convened on December 5, 1900, on the ground that Mr. Chamberlain for himself and his relatives had interested himself in government contracts, especially in those given to the Kynochs' of Birmingham for cordite, resulted on March 20, 1901, in a trial for damages brought by Arthur Chamberlain, brother of Joseph Chamberlain, and manager of the Kynochs Company, against the *Star* and *Morning Leader* for comments published by those papers with reference to the munitions of war supplied by Kynochs' to the government. Both papers had charged that several large firms, and especially Kynochs', unwarrantably obtained admiralty contracts through Arthur Chamberlain's efforts, and by aid of the prestige of Joseph Chamberlain, who was interested in the contracts either on his own account, or through holdings of his wife, brothers, sons and daughters. At the trial a letter intended to invite business was put in evidence from the London manager of Kynochs' saying, "No doubt you are aware that we are largely contractors to the War Office, and we may say that our chairman, Mr. Arthur Chamberlain, is a brother of the colonial secretary." On cross-examination, Arthur Chamberlain admitted that the Kynochs' secured government orders for cordite when their tenders were higher than those of others. It was also brought out that Kynochs' had been allowed to revise their bids while other concerns had not, and that Arthur Chamberlain had endeavored to bring pressure to bear on various Irish members of Parliament with a view to securing for his firm government contracts. The sum of £200 awarded by the court to Mr. Chamberlain on March 26 hardly tended to allay the impression that the papers decided against had not been very far wrong in their statements, except in so far as they had made implications against Mr. Joseph Chamberlain.

Army Reorganization.—The endless criticisms upon the efficiency of the army, caused by events rising out of the South African War, and more especially by the difficulty experienced in raising an adequate number of troops within a short time, and by the inefficiency of the troops when finally recruited, resulted in 1901 in an army reorganization law intended to systematize the existing formations of the army, to increase efficiency and to make the army prepared for any future emergency. The law enacted in brief that the home army should be divided into six army corps, situated respectively in Aldershot, Salisbury Plain, Ireland, Colchester, York, and Scotland; the first three corps of the army were to consist entirely of regulars ready at any time for foreign service, and the other three were to include sixty battalions of specially trained militia and volunteers. In the first three corps was to reside the main aggressive military power of the Empire in case of war, and nothing was to be left undone to bring each corps as a unit complete in itself up to the highest state of efficiency. All the corps, but especially the three corps of regulars, were to be kept fully equipped and were to be commanded by those officers who would take them to the front in event of war. The total of new troops under this scheme was to be 680,000, an increase over the home force as previously constituted of 125,500. The total force of 680,000 was to be divided as follows: Regulars, 155,000; reserves, 90,000; militia, 150,000; yeomanry, 35,000; and volunteers, 250,000. That the plan of army reorganization as thus outlined promised well on the surface was not gain-

said; but it was feared that much difficulty would be experienced in recruiting troops up to the requisite number, and that as the payment for troops had not been materially increased the same difficulty would be experienced as previously of inducing men to enter the service. Heretofore England had not had sufficient regular troops in England to constitute one whole army corps fit for immediate service abroad, and it was thought that a jump from one to three fit army corps could not be easily made unless some more drastic measures were employed, as for example, the employment of the draft or the raising of the soldier's wage up to a point that would make it a distinct inducement for him to enlist.

The appointments made in the fall of 1901 by Mr. Brodrick, secretary of state for war, under the new scheme for army reform raised much dissatisfaction in the English press. For to the only three fully officered and equipped army corps, there were appointed as commanders, in the order of their importance: Sir Redvers Buller, Sir Evelyn Wood, and the Duke of Connaught. The Duke of Connaught could not, for obvious reasons, it was said, go to the front in case of war; Sir Evelyn Wood was physically incapacitated from doing so; and no one, according to the English papers, supposed that, in view of his war record, Sir Redvers Buller would again be given a command. Notwithstanding, then, the distinct assertion of the war office that "no general should henceforth be appointed on the peace establishment who would not be fit and capable to undertake his command in war time," and notwithstanding the fact that it was exceedingly important that the only three effective corps in the army should be commanded by actual generals, the whole principle at stake in the long-discussed army reform bill had been thrown away in the first appointments made under it. Against the appointment of Sir Redvers Buller, the press was especially clamorous, both because the first army corps was the most important of the several commands, and because Sir Redvers had, among other things, doubted the advisability of relieving Ladysmith early in the Boer War. The press indeed demanded point blank that Sir Redvers Buller should be dismissed, and this demand so angered the general that in a speech on October 10 he at once admitted the various charges brought against him, and at the same time claimed that there was no officer, his junior in the army, so well fitted as himself for the command he had been given. The press thereupon vociferated the more loudly for Sir Redvers Buller's retirement, and on October 22, the war office so ordered it, and substituted General French as commander of the first army corps. While this last appointment was regarded everywhere as an excellent one, it only served to increase the criticism against the war office. For, it was said, obviously the war office was in full possession of all the facts regarding Sir Redvers Buller's military career before his appointment was made. If, then, the appointment was a proper one, and if Sir Redvers Buller was the most efficient man who could be chosen for the position, the war office should not have dismissed Sir Redvers Buller merely because he had made an indiscreet speech, which in no wise affected his military ability. In brief, the press alleged that it was the especial business of the war office to appoint the most efficient man available for active service, and either the original appointment of Sir Redvers Buller or else his retirement showed incapacity on the part of the war office.

GREECE, a constitutional monarchy lying south of the Ottoman Empire. The capital is Athens.

Area and Population.—The area of the 26 nomarchies (provinces) comprising Greece is 25,014 square miles. The population rose from 2,187,208 in 1889 to 2,433,806 in 1896. Including the Greeks in Turkey, Asia Minor, and the islands of the Ægean and Mediterranean, the Greek nationality numbers over 8,700,000. In 1896 Athens had 111,486 inhabitants. Religious toleration prevails, but the state church is the Greek Orthodox, of which the great majority of the inhabitants are adherents. Primary instruction is nominally compulsory.

Government.—The executive authority is vested in the king, who is assisted by a ministry of seven members appointed by him and responsible to the legislature. This body, the *Boulé*, or Chamber, consists of one house of 207 members elected by popular vote. The reigning king is George I., second son of Prince, now King, Christian of Denmark, who was chosen to his present position by the Greek national assembly in 1863. The heir apparent is Prince Constantine, who was born in 1868.

Army and Navy.—Able-bodied men of over 21 years of age are liable to military service. The regular army in 1900 numbered 25,180 men, of whom 1,894 were officers. The war footing is placed at 82,000. Besides a number of torpedo boats and unprotected vessels, the navy consists of five armored vessels. The government has ordered the construction of 2 new cruisers, 4 torpedo-boat destroyers, and 6 torpedo boats.

Finance.—To insure payment of interest on the foreign debt Greek finance is in great measure controlled by a commission established after the Græco-Turkish war, comprising representatives of the six mediating Powers—Great Britain, Germany, France, Austria-Hungary, Russia, and Italy. Greek finance is on a gold and silver

basis; the monetary unit is the drachma, worth 19.3 cents. The value of the paper drachma, though variable, may be placed at slightly over 12 cents. Revenue and expenditure in currency drachmai have been estimated as follows respectively: 1899, 107,085,658 and 103,418,273; 1900, 112,206,849 and 114,088,468; 1901, 115,734,159 and 113,646,301. The largest items of revenue in drachmai, in the estimate for 1900, were: Duties and excise, 40,482,000; direct taxes, 22,856,000; stamps and dues, 20,327,400; state monopolies, 12,710,750. The largest estimated expenditures in drachmai for the same year were as follows: public debt, 32,609,650; department of war, 18,398,586; of the interior, 16,266,061. Exclusive of the debt of 1833, the gold debt at the end of 1899 amounted to 701,967,000 drachmai, and the charges 15,035,057 drachmai; at the same date the paper debt amounted to 173,690,760 drachmai and the charges 5,083,500 drachmai.

Industries and Commerce.—The chief industry is agriculture, though even this is hardly in a progressive condition. Industrial improvement, however, was noted in 1899 and 1900. The most important crop is currants. Mining is carried on to some extent; in 1899 the manganese iron ore produced amounted to 306,625 tons, hematite, 134,384 tons; zinc ore, 23,710 tons; lead ore and galena, 15,749 tons. The imports and exports in 1898 amounted to 153,219,038 drachmai and 88,221,601 drachmai respectively; in 1899, 128,085,906 and 94,665,611; in 1900, 129,986,066 and 102,080,518. The values in drachmai of the leading imports in 1899 were: cereals, 35,081,749; yarn and textiles, 20,827,756; wood and timber, 9,141,698; coal and other minerals, 8,910,480; raw hides, 8,715,618. Similar figures for exports were: currants, 38,007,954; ores, 23,860,014; wines, 6,480,924; tobacco, 2,826,871; figs, 2,438,772; silk and cocoons, 1,790,402; cognac, 1,448,889; sponges, 1,320,040. The imports come chiefly from Great Britain, Russia, Turkey (including Egypt), Austria-Hungary, France, and Germany, named in order of importance; the exports go principally to Great Britain, Turkey (including Egypt), France, Austria-Hungary, Belgium, Netherlands, and Germany.

At the beginning of 1900 there were 641 miles of railway; at the beginning of 1899 the total length of the telegraph lines, land and submarine, was 5,300 miles. It was reported in September, 1901, that the government had granted a concession to a British company for building a new railway between the Piræus and the Turkish frontier, connecting the Greek railway system with the international Orient roads.

HISTORY.

Parliamentary Affairs.—At the session of the Chamber which began on October 30, 1900, the cabinet of M. Theotokis, the premier, was supported by a somewhat reduced but effective majority. The opposition, however, by adopting filibustering methods was enabled to impede legislation, and the early months of 1901 were occupied with fruitless efforts to secure the passage of a number of measures which the Theotokis ministry had fostered, but upon which they were unable to force a vote in spite of the fact that the opposition was not sufficiently numerous to record an adverse majority. The deadlock did not extend to all legislation, but only to the ministry's measures for the reform of internal taxation and the law courts. On every question of national defense or of foreign relations the government majority became effective. The most important measure passed by the Chamber was that establishing a fund for rebuilding the national fleet. Such a fund was established by private donations some years ago, and had been receiving a government subvention. The fund is now regularly established as a national institution, the intention being to supersede, little by little, the old-fashioned navy with modern ships of war. The passage by the Chamber of an act providing accident insurance for miners was heralded as an entirely new departure in Greek legislation; being the first law of a socialistic sort to be placed upon the statute books. The act was a government measure, and its passage was not due to any social pressure, Greece having been particularly free from labor agitation. The only other legislation of importance was a series of acts relating to agriculture, establishing a government agricultural college at Larissa and providing for forest preservation. A movement for the reform of the constitution, begun during the year, was favorably looked upon by the ministry, it being recognized that parliamentary government in Greece is artificial and does not run smoothly.

The Bible Riots.—In the fall of 1901 an agitation begun by students in the university at Athens led to serious riots, and resulted finally in the retirement of the Theotokis ministry. The causes of the disturbance were complex, being of a mingled linguistic, religious, and political character. For a number of years a school of writers have been attempting to raise the present Greek vernacular to the rank of a literary language—a movement which has met with strenuous opposition from the educated upper classes, among whom the language spoken more nearly conforms to classical Greek. The quarrel assumed a religious aspect when the Gospels were translated into modern Greek by M. Ralli. The translation was intended only for

private use and was not designed to supersede the ordinary Greek Testament in the use of the church. Although the Holy Synod apparently disapproved of the enterprise, the Metropolitan, Mgr. Procope defended the Synod's point of view rather weakly, while it became known that Queen Olga, whom it will be remembered is a Russian grand duchess, was decidedly favorable to the translation. When a part of this translation was published in the *Akropolis* at Athens, the university students, especially those of the theological school, took up the matter seriously. Some opposed the translation on purely literary grounds, others on religious grounds, while still others, pointing to Queen Olga's attitude, thought they saw in it a movement toward Pan-Slavism. The discontent culminated November 19-21 in riots, in the course of which there was a demonstration against the Metropolitan, attacks on the newspaper offices, and finally a serious fight with the police, in which seven persons were killed and a large number wounded. In order to calm the rioters the government effected the resignation of Mgr. Procope. The feeling was so intense, however, that it seemed advisable to place the adjustment of the difficulties in new hands; so although the Theotokis ministry still maintained its majority in the Chamber, its members handed in their resignation, it being understood that they would lend their support to any new ministry constituted in the settlement of the question involved. M. Thrasybulus Zaïmis formed a new ministry. M. Zaïmis, who is a moderate conservative, and who was premier before the Græco-Turkish War, was looked upon by all parties as the man who could best be depended upon to end the unfortunate crisis.

Foreign Relations.—A treaty with Roumania was ratified early in the year. The treaty touched upon questions not only of commerce, but of religion, education, and law, and was looked upon as a drawing together of the two nations that might have in it an important bearing upon the politics of the Balkan peninsula. An interpellation in the Chamber as to the massacre of Greeks in Macedonia drew from the Theotokis ministry a statement of the relations of Greece with Bulgaria. Bulgaria had been disposed to shirk responsibility for the affair, but the Greek government had acted promptly, with the result that Bulgaria had agreed to punish the offenders if possible, and had given a half promise of other reparation. All parties supported the government warmly in its declaration that Greek interests in Macedonia were of the utmost importance, and that it should be a cardinal point of Greek policy to insist upon proper protection of the lives and property of the large Greek population in that region. A number of differences with Turkey remaining unsettled since the Græco-Turkish War were, in the fall of 1900, submitted for arbitration to the representatives of the six great Powers at Constantinople. Their decision, announced in April, 1901, was favorable to Greece on almost every point in dispute. The questions were mostly as to the standing of Greek subjects in Turkey, and the settlement resulted practically in a restoration of the privileges accorded them previous to the war of 1897, which Turkey had withheld. The most important points decided were the restoration of the extraterritorial jurisdiction of Greek consuls in Turkey, and the exemption of Greek citizens from taxation. See *ARCHÆOLOGY* (paragraph Greece) and *CRETE*.

GREEK CHURCH, comprising the Orthodox Greek Church and the Russian Orthodox Church, has an established constituency of nearly 100,000,000; in this country, of about 45,000, of which 40,000 are communicants of the Russian branch. See *TOLSTOY*, *LYOF*.

GREEN, EDMUND FISKE. See *FISKE*, JOHN.

GREENAWAY, KATE, English illustrator, died in London, November 7, 1901. She was born in London in 1846, the daughter of a wood engraver, and was educated in the London art schools and at South Kensington. Miss Greenaway first won notice as a maker of Christmas cards at the time when color presses came into use. In the illustration of children's books she set a standard, with *Under the Window* in 1879, to which illustrators had before failed to attain. Her pictures, charmingly fanciful in costume arrangement, and reminiscent in tone, caught the public taste. But back of the fanciful child and the sketchy, rough drawing, there was a carefully trained artistic sense, and Miss Greenaway's drawings always suggested real children at real, every-day games. Among her best-known illustrated books are: *The Pied Piper of Hamelin*; *A Day in a Child's Life*; *Mother Goose*; and *Kate Greenaway's Alphabet*.

GREENLAND, a Danish island situated northeast of North America, has an estimated area of 46,740 square miles and a population (1890) of 10,516. The capital is Godthaab. The Danish colonies extend along the west coast from about 60° to about 72° north latitude; on the east coast a mission and trading station was established at Angmagsalik in 1894. The trade of Greenland is a monopoly of the Danish government and regularly yields a small annual surplus. The imports and exports in 1899 were valued at 631,000 kroner (\$169,000) and 325,000 kroner (\$87,000) re-

spectively. The exports to Denmark include whale, cod, and carrion oil, eiderdown, and seal oil (10,000 casks annually), seal skins (30,000), fox skins (2,600).

GREENOUGH, JAMES BRADSTREET, American educator, died at Cambridge, Mass., October 11, 1901. He was born at Portland, Me., in 1833, and graduated at Harvard in 1856. After graduating at the Harvard Law School, he practiced law for a time at Marshall, Mich.; became a tutor of Latin at Harvard in 1865, and in 1873 was chosen an assistant professor. In the following year he was given the rank of professor, which he held at the time of his death, being an active teacher until 1899. Professor Greenough prepared, with Joseph H. and William F. Allen, a well-known series of classical text-books. Besides these he wrote *The Rose and the Ring: A Christmas Pantomime* (1880); *The Queen of Hearts: A Dramatic Fantasia* (1885); and a *Special Vocabulary to Virgil* (1883).

GREGORWITCH, CHARLES, Russian violinist, attracted favorable notice in 1901, during his second American tour. He was born in St. Petersburg, October 25, 1867, and received his early musical education under Wieniawski at the Brussels Conservatory, Dont at Vienna, and Joachim at Berlin. He first came to America in 1896, after touring most of the European countries. As a technician M. Gregorowitch takes high rank among contemporary violinists.

GREGORY, WILLIAM, governor of Rhode Island, died at Wickford, in that State, December 16, 1901. He was born at Astoria, N. Y., August 3, 1849, and was educated at the Westerly, R. I., high school. He became a prominent mill owner and banker. In 1888 he was elected to the Rhode Island Assembly, to the Senate in 1894, and in 1898 became lieutenant-governor, and two years later governor.

GRENADA. See WINDWARD ISLANDS.

GRIGGS, JOHN WILLIAM, former governor of New Jersey, and a well-known lawyer of that State, resigned the office of attorney-general in President McKinley's cabinet early in April, 1901. He was born at Newton, N. J., July 10, 1849, and graduated at Lafayette College in 1868. Three years later he began the practice of law at Paterson, N. J., and in 1876 was sent to the New Jersey General Assembly. From 1882 to 1888 he was a State senator, and was governor from 1896 to 1898, when he resigned to accept the post of attorney-general of the United States. His last prominent appearance in that capacity was in December, 1900, when he made an argument for the government's right to levy duty on imports from Porto Rico and other newly acquired territories.

GRIMM, HERMANN, German art critic and writer, died in Berlin, June 16, 1901. He was born at Kassel, Germany, January 6, 1828, and was educated at the universities of Bonn and Berlin. He became, in 1873, professor of the history of fine arts at the University of Berlin. His writing consisted chiefly of essays on literature and art, although he published a number of novels, a drama *Arminius*, and a tragedy, *Demetrius*. His greatest work was a *Life of Michel Angelo* (2 vols. Hanover, 1860-63).

GRIPPE. See INFLUENZA, EPIDEMIC.

GRUMBKOW, VICTOR VON (GRUMBKOW PASHA), lieutenant-general in the Turkish army, died on board the Orient express from Constantinople to Germany, July 1, 1901. He was born in Germany in 1849, and entered the Prussian army at an early age. Attaining the rank of lieutenant-colonel in the Prussian forces, he, with the approval of the German Emperor, entered the service of the Sultan of Turkey. Together with General von der Goltz Pasha, of the Prussian engineers corps, General von Grumbkow was largely responsible for the reorganization of the Turkish army, particularly the artillery. In 1897, in the Græco-Turkish War, he saw his reconstructed army victorious, and was decorated on the field with the Osmanieh Order. He held the rank of lieutenant-general and was an aide-de-camp to the Sultan.

GUADALOUPE, a French colony in the West Indies, consists of the two islands of Basse-Terre and Grande-Terre, and five small island dependencies. It has a total area of 688 square miles and an estimated population of 167,000. The colony is administered by a governor and elected council, and is represented in the French parliament by a senator and two deputies. According to the local budget for 1900, revenue and expenditure balanced at 4,968,324 francs. The public debt amounted to 1,200,000 francs. France expended for the colony, according to the French budget of 1901, 1,586,213 francs. The imports in 1897 amounted to 18,400,000 francs and the exports to 16,300,000 francs. The trade is largely with France. The chief product is sugar, of which 44,840 tons were produced in 1898.

GUAM, the largest and most southerly of the Ladrone or Marianne Islands, ceded by Spain to the United States by the Treaty of Paris in 1898, is situated about 5,000 miles west of San Francisco and 1,500 miles east of the Philippines. The area is estimated at 150 square miles, and the total population between 9,000 and 10,000. Agaña, the capital, has 6,400 inhabitants. The government is administered under

direction of the United States Navy Department by a naval officer acting as governor. The present governor is Commander Seaton Schroeder. Although over half of the island is arable, very little of it is under cultivation, and its chief value lies in its importance as a naval base and coaling station, on the direct route between the United States and the Philippines. Sugar, rice, corn, wheat, figs, indigo, cotton, and cocoanuts are produced, but the only product exported to any extent is copra. A good road connects Agaña with the port of Apra, where, during 1901, the United States government determined to erect extensive coaling-docks and naval store-houses. The reforms instituted by Captain Richard P. Leary (*q.v.*), the first American governor, have been extended and enforced by his successor, Commander Schroeder. The sale of intoxicating liquors to the natives, without special license, has been prohibited, and the land laws and marriage customs have been reformed, with the result that the inhabitants are in a better condition than they ever were under Spanish rule, and the encouragement of agriculture and the introduction of new systems of labor and taxation have improved the industrial and social life. A system of public schools has been established, in which sectarian teaching is prohibited.

GUATEMALA. the most northern republic of Central America. The capital is Guatemala City.

Area and Population.—The 22 departments comprising Guatemala have an estimated area of 48,300 square miles and a population of over 1,574,000. Of the inhabitants, about 60 per cent. are Indians and the remainder largely mestizos. The population of Guatemala City is about 75,000. The prevailing religion is Roman Catholicism. In 1900 the national schools numbered 1,419 and the attendance, excepting that at 39 night schools, was 56,802. In addition there were 72 private schools, with an attendance of 3,702.

Government.—The chief executive is a president, who is assisted by a cabinet of six members. The president for the six-year term ending with 1904 is Señor Manuel Estrada Cabrera. The legislative power rests with an assembly elected by popular vote. The regular army comprises about 7,000 officers and men, and the effective army nearly 57,000 men.

Finance.—The monetary unit is the silver peso, worth 42.8 cents on October 1, 1901. In 1900 the estimated revenue amounted to 9,770,000 pesos (4,340,000 pesos from customs) and the estimated expenditure 9,611,201 pesos (3,157,856 pesos for finance, 1,998,203 for war, and 1,513,915 for public instruction). The paper currency of Guatemala is greatly depreciated. At the beginning of 1900 the total foreign debt amounted to \$9,087,414, and the total internal debt 25,763,776 pesos.

Industries and Commerce.—Agriculture is the principal industry, and coffee, sugar, corn, bananas, tobacco, and cacao the leading products. The estimated coffee crop for 1901 amounted to about 480,000 quintals, a decrease of about 40 per cent. as compared with the crop of 1900. Various minerals occur but are little worked. For 1898 the imports and exports, valued in gold pesos worth approximately one dollar in United States money, were reported at 4,850,835 and 5,648,286 respectively; for 1899 the imports are estimated at about 5,000,000 pesos gold, while the exports amounted to 8,370,555 pesos gold. The principal imports are cotton goods, food-stuffs, beverages, and iron and steel ware. In 1899 the chief exports, with values in gold pesos, were: Coffee, 7,390,477; hides and skins, 267,970; rubber, 256,921; sugar, 250,360; and bananas, 118,047. In the imports the United States is first, sending about two-fifths of the whole; in the exports Germany is first, since that country receives about four-sevenths of the coffee exported. During the last few years the trade with Great Britain has greatly suffered to the advantage of that with Germany.

Communications.—There are reported 262 miles of railway in operation. Guatemala City is connected with San José, 85 miles distant on the Pacific coast. A line from Puerto Barrios, on the Caribbean coast, has been projected to Guatemala City, about 193 miles distant; this line has been constructed to El Rancho, a distance of 133 miles, and in January, 1901, definite measures were taken for the completion of the road. In 1899 there were 279 post-offices and 3,400 miles of telegraph line. During 1900 and 1901 considerable improvement was made by the government in the roads of the republic. See CENTRAL AMERICA.

GUINEA WORM. See FILARIA.

GUZMÁN, HORACIO, South American diplomat, died at Washington, D. C., April 23, 1901. He was born at Granada, Nicaragua, February 3, 1850, and was educated at Leicester Academy, Mass., in Paris, and at the Jefferson Medical College of Philadelphia, Pa., where he graduated in 1882. He was chosen to represent Nicaragua at Washington in 1887, in which capacity he remained, with a short interruption, until 1894, when he was appointed, with the consent of his own government, representative of the Republic of Salvador at Washington. He served also as Nicaragua's representative to Mexico. In 1897 Dr. Guzmán became secretary to the Bureau of American Republics, and was acting director at the time of his death.

GYPSUM. The gypsum produced in the United States in 1900 amounted to 504,462 short tons, valued at \$1,627,203, as against 486,235 short tons, valued at \$1,287,080 in 1899. The 1900 production was more than double that of 1898 in both quantity and value. The product in 1900 came from seventeen States and Territories, of which the most important were Iowa, Kansas, Michigan, and New York. This great output was due to the increased use of patent wall plaster in modern office buildings, for it is found that plasters made of gypsum are harder than those made of lime. Much gypsum was also used in the production of staff. The value of the crude plaster was \$1.24 per short ton, of land plaster \$1.91, and of calcined \$3.79 to \$3.91. The imports in 1900 amounted to \$315,530 and were the largest on record, coming chiefly from Canada.

HABIBULLAH, Ameer of Afghanistan, who succeeded to the title upon the death of his father, Abdurrahman (*q.v.*), on October 3, 1901, was born at Samarkand, in 1872. His mother was the daughter of the Mir (chief) of Badakshan. He is the eldest of the surviving sons of the late ameer. From his earliest years he has been thrown into close relationship with the administration of Afghan affairs, as early as 1888 being intrusted with the government of Kabul during the war with Ishak. Of his two years' rule at Kabul his father wrote: "I found he had governed the country . . . wisely, cleverly, and . . . entirely in accordance with my wishes. . . ." In 1897 he was placed in control of the state treasury, and at the same time was constituted "the Supreme Court of Appeal." With this training behind him he is expected to follow closely in the firmly peaceful policy of his father; and one of his first declarations was that of his purpose to increase the army efficiency, and at the same time to reduce the tax rate.

HADLEY, HENRY K., American composer, whose symphony, *The Seasons*, produced in 1901, won for him the Paderewski prize of \$500 for the best orchestral work in symphonic form. He was born at Somerville, Mass., in 1871. After studying music in Boston and Vienna, he became instructor of music at St. Paul's School, Garden City, L. I. He is the author of numerous songs and piano pieces; he has written much chamber music, a number of concert overtures, symphonies, ballads, comic operas, a cantata, *In Musical Praise*, and several ballet suites.

HAGAN, JAMES, Confederate brigadier-general, died at Mobile, Ala., November 7, 1901. He was born in Ireland, in 1821, and came to the United States in time to serve through the Mexican War. At the outbreak of the Civil War he was commissioned a captain, and after the battle of Shiloh was made colonel of the Third Alabama cavalry. During the last two years of the war he was a brigade commander under General Joseph Wheeler, and before the close of hostilities was commissioned a brigadier-general.

HAGUE CONFERENCE. As a result of the peace conference at The Hague in 1899, a permanent international court of arbitration has been formed, for an account of which see **ARBITRATION**, **INTERNATIONAL**.

HAILSTORM PREVENTION. See **METEOROLOGY**.

HAITI, a republic occupying the western portion of the island of the same name, the eastern portion of which is occupied by the republic of Santo Domingo. The area is 10,204 square miles, and the population (1900) 1,244,650, over 90 per cent. of whom are negroes, and most of the remainder mulattoes. The capital is Port-au-Prince, with a population of 70,000. The executive power is vested in a president (General Tiresias Simon Sam since 1896), elected for a term of seven years, nominally by the people, but in practice by the legislature, comprised of a senate and a chamber of representatives.

Finance.—The financial condition of the country is improving, and in 1900, for the first time in several years, the government was not obliged to resort to a loan to meet its current expenses. The revenue is obtained almost entirely from import and export duties, the former being payable in currency and the latter in American gold. Import duties in 1900 yielded \$4,293,097, as against \$2,573,230 in 1899, and the export duties \$3,332,300, as against \$2,811,847 in the preceding year. At the same time the expenditure decreased from \$7,255,193 to \$6,589,480. The public debt is about \$27,000,000. The monetary circulation, as reported early in 1901, had reached a total of \$7,444,390, of which \$1,250,000 was American gold. The United States gold dollar is the standard of value.

Industries, Commerce, etc.—The country is chiefly agricultural, and coffee, cacao, logwood, honey, hides, and cotton are the principal products. The imports increased in value from \$3,943,800 in 1899 to \$4,033,800 in 1900, and the exports from \$12,747,900 to \$13,608,000. The exportation of the four leading products increased in amount in 1900 over 1899 as follows (in pounds): Coffee, 72,122,781, against 61,622,184; cacao, 4,224,691, against 4,039,500; logwood, 106,066,469, against 82,836,302, and cotton, 2,050,128, against 1,471,992. Two-thirds of the export trade is with the United

States. The exportation of coffee would be much greater than it is were it not for an export duty thereon of \$3.80 per hundred pounds.

HALIBURTON, ROBERT GRANT, Q. C., Canadian lawyer and scientist, died at Pass Christian, Miss., March 7, 1901. He was born at Windsor, Nova Scotia, June 3, 1831, and was educated at King's College there, and admitted to the bar in 1853. He soon became prominent in his profession, and during his practice conducted many important cases. In 1870, when the government was about to withdraw the troops sent to quell the revolt of the newly acquired Manitoba territory, Mr. Haliburton succeeded in frustrating the act, by a timely discovery of the plan, and saved the territory to the Dominion. He was a publicist of repute and wrote many magazine articles on legal, scientific, and ethnological subjects.

HALIL RIFAT, PASHA, Grand Vizier of Turkey, died at Constantinople, November 9, 1901. He was born at Seres, Turkey, in 1807. Early in life he entered the public service as secretary in the office of the governor-general of Salonika, and advanced to provincial governor, at Widdin, and later at Rustchuk. Subsequently he was governor at Sivas, Smyrna, Bagdad, and Monastir. He entered the Turkish cabinet in 1893 as minister of the interior, and in 1897 was made grand vizier.

HALL, ASAPH, professor of astronomy at Harvard University, was elected president of the American Association for the Advancement of Science in 1901. He was born at Goshen, Conn., October 15, 1829. His education was received at the University of Michigan and at Harvard University, where he was assistant in the astronomical observatory from 1857 to 1862. In 1863 he was made a professor in the United States Navy and attached to the Naval Observatory, where he served until his appointment as professor at Harvard in 1895. He has taken a prominent part in all of the astronomical work carried on by the United States government, particularly in foreign expeditions. The most important of his discoveries was the two moons of Mars, in August, 1877, but he is also known for his observations of double stars and the satellites of Saturn, and has received many honors for his discoveries and investigations. He was elected a member of the National Academy of Sciences in 1875 and has served as its vice-president.

HAMILTON COLLEGE, Clinton, N. Y., founded 1812, has a faculty of 19 professors and instructors, and a student body of 183. There are 50 permanent scholarship endowments. The sum of \$50,000 has been donated anonymously for the erection of a commons. The library contains 41,386 volumes and 27,011 pamphlets, which represents an increase during 1901 of about 1,000 volumes and 3,600 pamphlets.

HARKNESS, HARVEY W., American physician and naturalist, died in San Francisco, May 10, 1901. He was born at Pelham, Mass., May 25, 1821, and studied medicine at Berkshire Medical College, Pittsfield, Mass., graduating in 1847. Two years later he went to California, where he established himself as a practicing physician, but found time to pursue entomological and botanical studies. From 1887-1896 he was president of the California Academy of Sciences, and to this organization he presented his botanical collection, numbering some 10,000 specimens. He was the author of many scientific papers, particularly in the department of cryptogamic botany.

HARMSWORTH, ALFRED CHARLES, editor and proprietor of the *London Daily Mail*, visited the United States in 1901, and illustrated his theory, that the newspapers of the future would assume a "tabloid" form, by applying his ideas to the issue of a New York morning newspaper. Mr. Harmsworth made this issue of the newspaper a thirty-two-page small quarto magazine, in which each item of news was disposed of in the most compressed form. He was born near Dublin, Ireland, July 15, 1865, and was educated at Stamford and under a private tutor. In 1882 he entered the office of the *Illustrated London News* in an editorial capacity, and in 1888 he started *Answers*, a weekly journal. The *Evening News* passed into his control in 1894, and two years later he founded the *Daily Mail*, following this in 1898 with *Harmsworth's Magazine*.

HARRISON, BENJAMIN, President of the United States from 1888 to 1892, was born in North Bend, Hamilton County, O., August 20, 1833, and died at his home in Indianapolis, March 13, 1901. He was the grandson of William Henry Harrison, ninth President of the United States, and the great-grandson of Benjamin Harrison, one of the signers of the Declaration of Independence and three times governor of Virginia. Of John Scott Harrison, father of Benjamin Harrison, the younger, it was somewhat ungraciously said that his only claim to distinction lay in the fact that he was "the son of a great father and the father of a great son"; but for all that he was twice elected to Congress. His son Benjamin received his elementary education, first at a log schoolhouse, then at an academy near Cincinnati, and finally at Miami University, Oxford, O., where he graduated in 1852. He immediately

began the study of law and was admitted to the bar in 1853. In the following year he removed to Indianapolis, where he afterward made his home. Mr. Harrison's political career began with the reorganization of the Republican party in 1860, when he canvassed the State and was elected reporter of the Supreme Court. In August, 1862, he took the field in the Union cause as colonel of the Seventieth Regiment of Indiana Volunteers, and was honorably discharged in June, 1865, having been brevetted brigadier-general. In 1868 he refused a third nomination for reporter of the Supreme Court and returned to the practice of law, gaining prestige steadily as a thorough, conscientious, and able attorney. In 1876 Mr. Harrison was an unsuccessful candidate for governor, though he ran 2,000 votes ahead of his ticket; in 1879 he was appointed a member of the Mississippi River Commission by President Hayes, and in 1880 he was chairman of the Indiana delegation in the convention which nominated James A. Garfield for the presidency. In 1881 the State legislature being then Republican, he was elected to the United States Senate. While in the Senate Mr. Harrison acted in pretty strict accordance with the views of his party. As chairman of the committee on territories he demanded statehood for the Dakotas, Montana, Idaho, and Washington; he opposed Cleveland's vetoes of pension bills and urged the reconstruction of the navy and the adoption of civil service reform. In the Indiana elections of 1886 the Democrats, having gerrymandered the State, obtained a majority in the legislature, although the popular vote was against them. Thus Mr. Harrison was not returned to the Senate, and the Republicans, feeling that he had been unjustly deprived of office and that his party record was deserving of high recognition, determined that he should be nominated for the presidency in the convention of 1888. Hon. James G. Blaine, then the most prominent Republican in the country, would not have the nomination, and as Mr. Harrison came from one of the great doubtful States, and was, moreover, solidly supported by his delegation, he was nominated on the eighth ballot as a compromise candidate.

When Mr. Harrison took the Presidential chair, his party in Congress proceeded promptly, at the session which met in December, 1889, to fulfill their pledges made in convention. The McKinley *protective* tariff of 1890, reversing the Democratic principle of a "tariff for revenue only," was one of the important measures passed. It did not, however, meet the approval of the country, and was, as subsequent events showed, largely instrumental in defeating the Republicans in the fall elections of 1890. A more important measure passed in 1890 was the Sherman Silver Bill. The Bland Silver Bill of 1878, providing for the coinage of not less than \$2,000,000 of silver per month, had only whetted the appetites of the silver-mine interests, and there was a widespread demand that silver should receive some more substantial recognition in the country's currency. President Harrison's position on this subject was intermediate between the silver radicals and the gold monometallists. "I have always been an advocate," he said in his first annual message to Congress, "of the use of silver in our currency. We are large producers of that metal and should not discredit it." At the same time, pending an international bimetallic agreement, "I think it is clear that if we should make the coinage of silver at the present ratio free, we must expect that the difference in the bullion values of the gold and silver dollars will be taken account of in commercial transactions." The plan which the President presented to Congress, through the secretary of the Treasury, in order to placate the silver interests, while at the same time maintaining the financial stability of the country, was to permit the secretary to issue certificates against the deposit of bullion at its market value. This plan was enacted in the Sherman Law of 1890, and the secretary was directed to issue treasury certificates against 4,500,000 ounces of silver monthly, or so much of that amount as was offered to him. Shortly before this time, in November, 1889, the coinage of silver dollars amounted to \$343,638,001, of which \$283,539,521 were held in the treasury. Under the operation of the Sherman Law the treasury largely increased its purchases, issuing, up to July 15, 1890, \$147,000,000 in certificates against silver bullion. While it has been generally considered by financial interests that President Harrison erred in his interpretation of the disturbing financial events which followed the passage of the Sherman Act, and that the panic of 1893 might in fact be pretty directly attributed to that act, yet in 1890 the silver interests were so strong in both parties that legislation of some kind was inevitable. What President Harrison really brought about was "a truce after long struggle between the advocates of free silver coinage and those intending to be more conservative." And having made the truce, the President declined to see it broken. In the political history of the country his administration was in this respect of great importance, that the Sherman Act and its repeal in 1893 forced to a definite and clear-cut issue, in which there was no middle ground, the question of gold monometallism *vs.* the unlimited free coinage of silver.

Pensions.—In accordance with his long-expressed conviction, President Harrison recommended that the pension law be made much more liberal. As this law stood when he came into office, Union soldiers and sailors were entitled to pensions if they

received disabilities resulting from service. The President urged that if former Union soldiers and sailors suffered from disability for any cause, they should receive pensions. The origin of disability, he said, was often difficult, and in many cases impossible to establish. There were, moreover, many men who, having been under arms for three or four years, were justly entitled to pensions for that reason alone. By the act of June 27, 1890, which Congress passed in accordance with this recommendation, allowing pensions to soldiers or sailors who had served 90 days or more, and who had subsequently become invalided for any cause except their own vicious habits, the value of the pension roll rose \$58,000,000 in three years; from \$72,052,143 on June 30, 1890, to \$130,510,179 on June 30, 1893.

Force Bill.—A bill for whose passage the President was very solicitous was that giving the Federal authority power to supervise State elections, in order that the entire negro vote might be cast and correctly counted in the South, as contemplated in the fifteenth amendment to the Constitution. It was urged against this measure that it would tread on State rights; that it was a political expedient for getting Republican votes from Democratic territory; that it would intensify and solidify sectional feeling, constitute a second Federal "carpet-bag" régime, and by again binding together in unified resentment the South against the North, work grave public mischief. The President, however, with the inflexible conscientiousness that was characteristic of him, continued to demand that the Constitution be complied with, whether or not it was practically expedient; and thereby he is said to have shown himself abler as a moralist and logician than a statesman and man of affairs. Notwithstanding a Republican schism and a solid Democratic opposition, the President insisted in his four annual messages that the national government should interfere in southern elections. His reasons were unanswerable in law and in "pure reason." Starting from the undisputed premise that in the South the negroes were by various devices deprived of any effectual exercise of the political and of many of the civil rights guaranteed them by the Federal law, the President reached the unavoidable conclusion that "the colored man should be protected in all his relations to the Federal government, whether as litigant, juror, or witness in our courts, as an elector for members of Congress, or as a peaceful traveler upon our interstate railways." Following the President's recommendations, bills were introduced in Congress; but their progress was delayed and retarded in committees, and they were finally shelved when an alliance was made known between the Democrats and a group of western Republicans, by which the latter were to vote against the Force Bill in return for the help of the former in obtaining silver legislation. The defeat of the attempt to secure for the negro the rights given him under the Constitution, coming, as the defeat did, after prolonged discussion and agitation, was generally considered as tantamount to an admission by the North that a mistake had been made in conferring those rights upon the negro. So far as legislation was concerned the subject was definitely dropped, the South being inferentially given to understand that within reasonable limits no bar would be placed upon its readjusting for itself its "peculiar problem."

Other Affairs of the Administration.—If the position of President Harrison on the matter of civil service did not entirely please reformers, it appeared to please his party leaders no better. "Honorable party service," said the President, "will certainly not be esteemed by me a disqualification for public office, but it will in no case be allowed to serve as a shield of official negligence, incompetency, or delinquency." To the letter and spirit of this statement the President kept with much exactness. While he paid numerous party debts, the politicians generally found him cold upon the subject of gaining unfair advantage through patronage dispensation, and they disliked him accordingly. In appointments to the bench, moreover, the President practically disregarded all partisan considerations, taking care only that both parties and all sections of the country should be ably represented.

Throughout his administration, President Harrison consistently advocated the increase of the navy. In his inaugural, he said: "Judged by modern standards, we are practically without coast defenses. The security of our coast cities should not rest altogether in the friendly disposition of other nations. There should be a second line wholly in our own keeping." In this respect the President agreed with President Arthur and President Cleveland, and urged that the work of steel naval construction initiated by them should be carried on with greater rapidity. The policy of the administration of President McKinley to develop American commerce with Central and South America, China, and Japan, and to subsidize American vessels for this purpose, was also definitely outlined by President Harrison, who saw great and growing possibilities in trade with those countries. The attitude of the United States toward Great Britain's apparent determination to take over "without the advice or consent of any other nation," territory generally considered to belong to Venezuela, and President Cleveland's famous message to Congress upon that subject in 1895, were both foreshadowed by President Harrison, who said, in Decem-

ber, 1891: "I should have been glad to announce some favorable disposition of the boundary dispute between Great Britain and Venezuela. This government will continue to express its concern at any appearance of foreign encroachment in territories long under the administrative control of American states."

The last distinguishing act of the President's administration was his endeavor, upon the overthrow of the monarchy of Hawaii at the initiative of the American residents, to obtain from the Senate the ratification of a treaty annexing Hawaii. The Senate, however, did not ratify the treaty in the few days intervening between February 15 and the President's retirement from office on March 4, and on March 9 President Cleveland withdrew the treaty and appointed a special commissioner to examine the conditions under which it had been sent from Hawaii. As this commissioner reported that "beyond all question the constitutional government of Hawaii had been subverted with the active aid of the United States representative to Hawaii," President Cleveland would not re-submit the treaty to the Senate, but endeavored instead, though unsuccessfully, to restore Queen Liliuokalani to power. With the accession of President McKinley in 1897, the Hawaiian policy of President Harrison was again adopted and the islands were formally annexed in 1898.

Failure of Reelection and After Years.—Taken as a whole, the administration of President Harrison was not marked by party harmony; and this, perhaps, as much as anything else, was the cause of his failure to be reelected. All during his term he was dogged with the charge of being "cold"; so cold that "his political advisers rode in ice wagons," that "grass would not grow on the White House grounds," and that "the Church of the Covenant, though afire, was safe enough as long as it held the President's pew." The fact availed him nothing that "when his friends were assailed and needed his support, his sympathy became a wall of granite around them." The important political consideration was, "he was hard to get along with," inflexible in his "convictions," and "obtuse on matters of every-day political expediency." On June 4, 1892, three days before the National Republican Convention met, James G. Blaine resigned from the cabinet and announced himself as a candidate for the presidency. But at that time Mr. Blaine was broken in health, his political following was largely dissipated, and the movement to nominate him could not but be abortive. William McKinley, who, it was thought, might easily have been nominated, absolutely refused, out of loyalty to the President, to consider such a proposition. Mr. Harrison, therefore, was renominated on the first ballot. In the November elections he was defeated by Grover Cleveland, the electoral vote being 277 to 145.

After his retirement Mr. Harrison gained steadily in repute and prestige. He was the principal counsel for Venezuela before the Anglo-Venezuelan Boundary Arbitration Commission at Paris in 1899, and was appointed by President McKinley a member of the Hague Arbitration Commission. Relieved from the burdens and prejudices of office, he appeared at once to broaden in many ways, and the people at large, in view both of his well-known integrity and the disinterested position he occupied, were prepared to defer to and widely quote any statements he might make on current topics. Like Senator Hoar, Mr. Harrison took sharp exception to President McKinley's colonial policy, and like Senator Hoar, he considered, nevertheless, that the Republican administration should be sustained in the elections of 1900. After President McKinley's reelection, Mr. Harrison was more outspoken upon the administration's Eastern policy, and his objections to it, as stated in his writings, were widely quoted.

On October 20, 1853, Mr. Harrison married Miss Caroline Lavinia Scott, daughter of the Rev. John W. Scott, and sister of ex-Judge John N. Scott, a practicing attorney of Indianapolis. He had by her two children, Russell and Mary, who afterward became the wife of Robert J. McKee, of New York. In October, 1892, Mrs. Harrison died, during the heat of the presidential campaign. In April, 1896, Mr. Harrison was married to Mrs. Mary Scott Lord Dimmock, his first wife's niece, by whom he had one daughter.

HARRISON, HENRY BALDWIN, former governor of Connecticut, died at New Haven, October 29, 1901. He was born at New Haven, September 11, 1821, and graduated at the head of his class at Yale University in 1846. He was admitted to the bar, and in 1854 was elected to the State senate. During his service he drafted the Personal Liberty Bill, which resulted in the practical nullification of the Fugitive Slave Law. Mr. Harrison helped to organize the Republican party in 1856, and in 1865 he was elected to the first of his four terms in the State assembly. As a Republican he was elected governor in 1884.

HART, JAMES MACDOUGALL, American landscape painter, died in Brooklyn, N. Y., October 23, 1901. He was born at Kilmarnock, Scotland, May 10, 1828, and was brought by his parents to the United States in 1830. He studied landscape painting at Düsseldorf in 1850-53. In 1859 he was made a member of the Academy of Design, in the council of which he served for a number of years. His best work was in landscapes, including cattle, and among his well-known pictures are: "The

Drove at the Ford" (in the Corcoran Art Gallery, Washington); "At the Brookside" (in the Metropolitan Museum of Art, New York City); and "In the Autumn Woods" (Sayles Memorial Hall, Providence, R. I.).

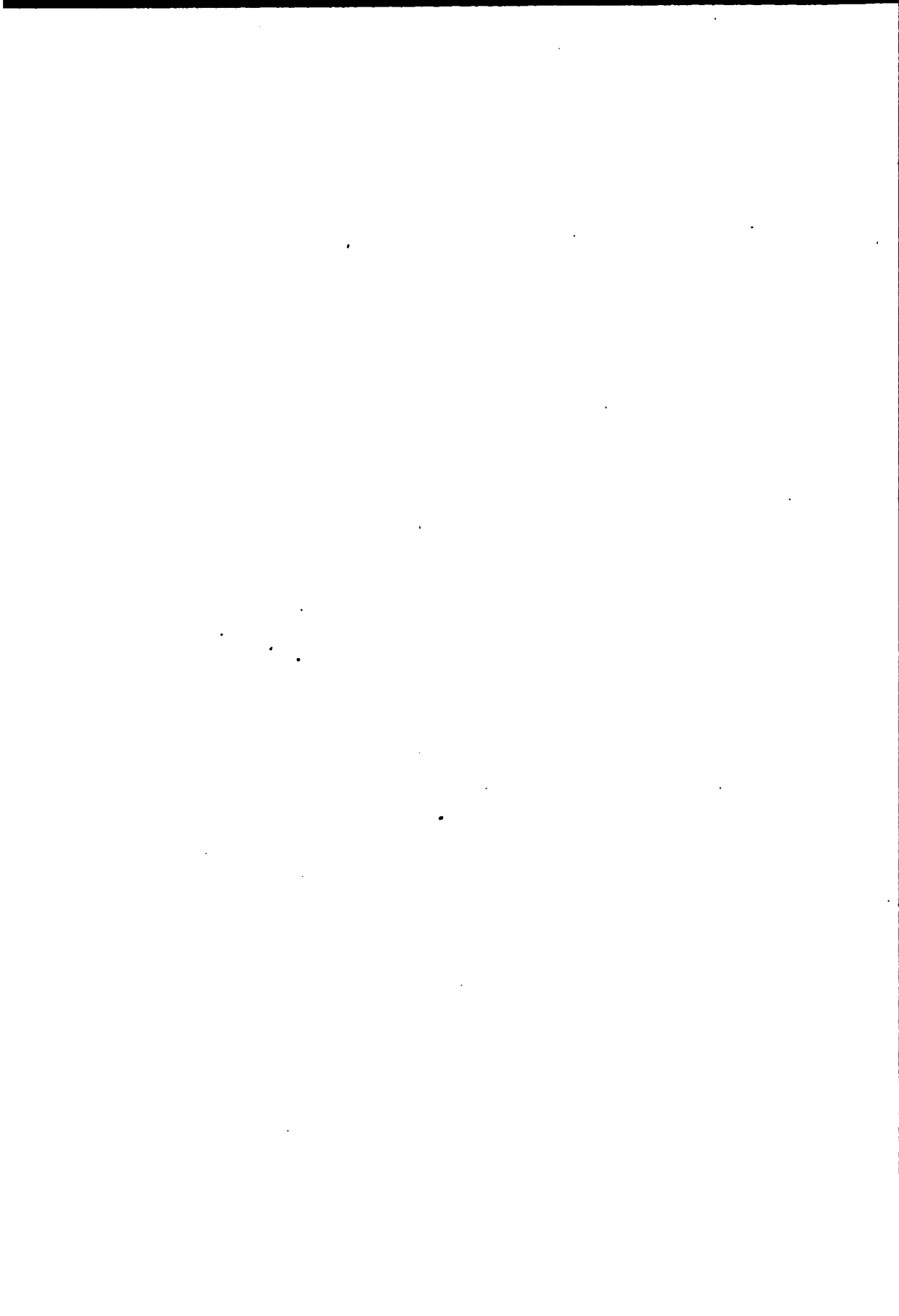
HARVARD UNIVERSITY, Cambridge, Mass., founded 1636, is the oldest, most influential, and still the largest of American educational institutions. Its student enrollment in 1901 was the largest in its history, showing a total of 5,576 in all departments. The teaching staff numbered 475, exceeding that of any other American institution, though its ratio of teachers to students, 1 to 11, is higher than in several other universities, notably Johns Hopkins, where it is 1 to 5. The year 1901 was marked by no special event, unless it was the great advance made by the medical school. From having the least satisfactory financial support of any of the professional schools a few years ago, it now can claim the best. Early in the year Mr. J. Pierpont Morgan signified his intention of supplying three of the much-needed buildings, at a cost, including buildings and lands, of more than \$1,000,000. Late in the year came the gift of \$1,000,000 from Mr. John D. Rockefeller as an endowment. In 1901, which was the last year that a candidate could enter the medical school without a bachelor's degree, the attendance considerably increased, though the relatively large numbers dropped at mid-year brought the attendance to the normal point. During the year the School of Veterinary Medicine was closed on account of lack of support, both in students and in funds. This is the first time that the university has ever been compelled to abandon a department of instruction once adopted by it. For some time the faculty has been considering the redefinition of the requirements for the degree of Bachelor of Arts, to the intent that the college course might be shortened to a three-years' term for the average student, without any material reduction of the standards. Many other institutions are merely waiting for Harvard to take the lead in this much-needed reform. While the faculty adopted no definite revision, they presented a clear statement of the present practices with regard to recommending for the degree candidates who have been in residence less than four years. Under this practice, any young man of industry and fair ability can obtain the degree in three years, if he makes, rather early in his course, an intelligent plan for accomplishing that object. In respect to the higher degrees, President Eliot calls attention to the long period required for the Doctorate, and to the fact that the average age of those taking the degree is 27 years, indicating an unnecessary expenditure of time at some period in the educational career. The position is also taken that the standards for the doctor's thesis are too high for a man of the maturity and experience that the candidate would have should the degree be taken at a proper age. As usual, the president's report is one of the most valuable educational documents of the year, many of the points discussed, as college athletics, research, and library reorganization, being mentioned in the article Universities and Colleges (*q.v.*). The additions to the library during the year were 16,000. In 1901 an extraordinary number of buildings were under construction for the university, namely, the Nelson Robinson, Jr., Hall for Architecture, the Semitic Museum, the Simkins Laboratory, Pierce Hall, and the Harvard Union. The total expenditure for these buildings was over \$820,000. For the endowment of the Robinson Hall of Architecture, \$300,000 was also given. There was a net increase for the year of over \$500,000 in the endowment funds, which now amount to over \$13,000,000.

HARVEY, Rev. MOSES, Canadian scientist and author, died at St. Johns, N. F., September 3, 1901. He was born at Armagh, Ireland, in 1820, and was educated for the ministry at the Royal College, Belfast. For eight years (1844-52) he was pastor of a church at Maryport, Cumberland, England, and went from there to St. Andrew's Free Church, at St. Johns, where he stayed until 1878, when he retired from active church work. In recognition of his scientific research, he was in 1886 elected a fellow of the Royal Geographical Society of England, and in 1891 a fellow of the Royal Society of Canada. In 1873 Dr. Harvey discovered the giant cuttle-fish, *Archethuthis Harveyi*, now in the Smithsonian Institution at Washington. His writings include: *Lectures on the Harmony of Science and Revelation* (1856); *A Text-Book of Newfoundland History* (1890); and *Newfoundland as It is in 1894*.

HATCH, JOHN PORTER, major-general U. S. V., died in New York City. April 12, 1901. He was born at Oswego, N. Y., January 9, 1822, and graduated at West Point in 1845. He served throughout the Mexican War, being brevetted twice for gallantry, and during the first year of the Civil War was appointed brigadier-general of volunteers in the Union army. He held command of a brigade under General Banks in the Shenandoah Valley campaign, and at the close of the war had attained the rank of major-general of volunteers and brevet brigadier-general in the regular service. Continuing in the service, he was retired in 1886 with rank of colonel.

HATZFELDT-WILDENBURG, Count von, PAUL MELCHIOR HUBERT GUSTAV, German diplomat, died in London, November 22, 1901. He was born in 1831, and was educated in law at the universities of Bonn and Berlin. Entering the diplo-

HARVARD UNIVERSITY.—Harvard Union.



matic service as attaché at Paris, he was later transferred to Washington, and returned to Paris as secretary of embassy in 1860. In 1867 he was appointed to the foreign office at Berlin, and there came into close and friendly relations with Prince Bismarck, whom he accompanied to Paris during the Franco-Prussian War. Retaining his position at Berlin until 1874, he was sent to Madrid as German minister, and there saw the end of the Carlist rising and the restoration of the monarchy under Alfonso XII. In 1878 he was sent as ambassador to Constantinople, where he did much to cement friendly relations between his country and Turkey. Again, in 1881, he was recalled to Berlin to be secretary of state in the foreign office, where he worked once more in complete harmony with Prince Bismarck. In 1885, upon the transfer of Count Münster from London to Paris, Count Hatzfeldt was sent to London as German ambassador. During his sixteen years tenure of this office he was instrumental in arranging the agreement of 1890 with regard to Africa and the cession of Heligoland, the Samoa agreement of 1899, and the agreement of 1900 with regard to China, as well as other important questions bearing upon German colonial and commercial enterprises.

HAWAII, or SANDWICH ISLANDS, a group of small islands in the Pacific Ocean, about 2,100 miles west-southwest of San Francisco, Cal. The islands were acquired by the United States under an act of Congress of July 7, 1898, and were organized as the "Territory of Hawaii" by an act of April 30, 1900. The capital is Honolulu, on the island of Oahu.

Area and Population.—The group includes 8 inhabited islands, with an approximate area of 6,449 square miles; the other islands are small and unimportant. The islands are volcanic in origin, and are largely composed of barren mountains, the only inhabitable portions being "the narrow strips of land extending from the bases of the mountains to the sea." Maui, Oahu, and Kauai comprise about 90 per cent. of the territorial area, and had in 1900 a population of 151,325, or 98.3 per cent. of the total. The total population of the islands, according to the census of 1900, was 153,727, against 109,020 in 1896 and 89,990 in 1890. By race the main elements constituting the population in 1900 were: Hawaiians, 29,834; part Hawaiians, 7,835; Chinese, 25,742; Japanese, 61,122, and Caucasians, 28,533. The number of Hawaiians has steadily declined, the death-rate continuing much higher than that of the other races, and the birth-rate lower. While in 1872 the number of Hawaiians was placed at 49,044, in 1900 the number had declined to 29,834. Many reasons have been assigned for this, but the true physiological cause appears unknown.

Receipts and Expenditure.—The principal sources of revenue for the Territory are taxes upon real and personal property, the sale of territorial internal revenue stamps, license fees, inheritance taxes, land rents, and land sales. Taxes levied upon real and personal property are limited to 1 per cent. of the assessed value of the property; but, unlike most assessments in the United States, the Hawaiian assessments are made upon the basis of actual cash value. To add, however, to the revenue of the Territory, an income tax of 2 per cent. was established by the legislature at its first session in 1901, and this tax, though appealed, was sustained by the courts. The assessed valuation of property in 1901 was \$121,172,928, as against \$100,297,460 in 1900 and \$78,963,297 in 1899. The receipts for the fiscal year 1901 were \$2,140,297.36 and the expenditures \$2,925,703.53; in 1900 the receipts were \$2,772,871.87 and the expenditures \$3,680,184.91. For the fiscal year ending June 30, 1892, the estimated receipts were \$2,565,500.

Industries.—The manufacturing industries of Hawaii may be divided broadly into two kinds: various small ones which are maintained only to supply the local demands of the islands, and one large industry, the manufacture of sugar, springing from and dependent upon the territorial supply of sugar cane. The gross value of all industries in Hawaii in 1900, inclusive of products valued at \$3,101,806 re-used in the process of manufacture, was \$24,992,068, and of this latter amount \$19,254,773, or 77 per cent. of the whole, was the product of the sugar manufacturing industry. Sugar mills of the best kind, equipped with modern machinery, have been built in Hawaii, and the continued and increased success of the industry is assured, provided that the sugar-cane supply is kept sufficient; but this is in turn dependent upon the labor supply, and the labor supply appears to be at present a matter of political consideration. See following paragraph; also *COFFEE*.

Labor Conditions.—The prosperity of Hawaii appears to depend absolutely upon the successful and economical production of sugar. Upon this production is based the only large manufacturing industry of the islands and the only article of export enabling the Hawaiians to carry on commerce with the mainland. Of other industries native to Hawaii there are none, and other agricultural crops have either never passed the experimental stage or else are limited in quantity to the needs of the islanders themselves. The wealth of Hawaii, therefore, depends upon her sugar crop. Before the act of 1900, by which Hawaii was made a Territory of the United States, Chinese and Japanese were brought freely to the islands to work in the

sugar fields, and an abundant supply of cheap labor was assured. But the act of 1900 applied the immigration laws of the United States to Hawaii, and thereafter it was impossible to import alien contract laborers. Immediately labor became scarce and its quality deteriorated. Americans were unable to withstand the severe work of the sugar fields, and the supply from the East being cut off, the remaining laborers were in much less need, competition being removed, to find favor with their employers. Moreover, many of the former laborers had already gained a competence and so returned to their own country, 4,079 Japanese alone leaving between June 14, 1900, and September 1, 1901, and only 589 arriving to take their place. This and other deficiencies were in part made up by the importation of some 2,000 Porto Ricans in the summer of 1901; but the plantations were nevertheless so short-handed that, as stated by the acting-governor in his annual report for 1901, "all sugar plantation stocks have fallen far below their former value, owing to the uncertainty of the labor supply," and "if no relief is forthcoming the most disastrous results will surely follow."

Education.—The progress of education in Hawaii, conducted upon the grade system, with English as the basis of instruction, appears by the report of the acting-governor for 1901 to be upon the whole satisfactory, although the lack of sufficient funds for the erection of necessary school buildings acts as a serious handicap. The department of education has endeavored to shape schools to the actual needs of the people, and in this effort has established night schools, industrial schools, and a normal school. The night schools are open to pupils of all ages and all nationalities; the normal school is conducted to enable young men and women to become teachers in Hawaiian schools; the industrial school for boys has been equipped with a site of 733 acres of land, and will, it is believed, soon become self-supporting; and an industrial school for girls is in process of organization. As to higher-grade education, it is pointed out with some pride that the graduates of the high school at Honolulu are accepted as regular students by several United States universities without further examination. The amount expended for Hawaiian schools for the year ending June 30, 1901, was \$306,299.56.

Franchise Question.—When Congress was formulating the territorial act for the government of Hawaii in the spring of 1900, earnest representations were made at Washington urging a property qualification for the right of suffrage, on the ground that a general suffrage, placing the Hawaiians and poorer classes in power, would be prejudicial to American interests. These arguments were, however, rejected by Congress, and the islanders were given practically universal suffrage. As a result the native Hawaiians would not ally themselves with either the Republican or the Democratic party in the elections of November, 1900, but formed an independent party, pledged to "home rule," or "Hawaii for the Hawaiians." This party triumphed at the polls, elected Robert W. Wilcox as delegate to Congress, and in the territorial legislature elected nine of the fifteen senators and twenty-two of the thirty representatives.

Fire Claims.—During the prevalence of the bubonic plague in Honolulu between December, 1899, and February, 1900, it was found necessary to condemn and order burned many buildings in the "Chinatown" section of the city. One of the fires thus occasioned passed beyond control, destroyed "Chinatown" entire, and rendered homeless some five or six thousand Chinese, Japanese, and Hawaiians. No relief was afforded to the losers until in 1901 the territorial legislature passed "an act to provide for the ascertainment and payment of all claims" caused by the fire, and appropriated \$1,500,000 for this purpose. The direct expenses incurred by Hawaii in suppressing the plague had already cost \$720,488.07, and up to August 28, 1901, the claims for fire damages had aggregated \$2,472,451.83.

Legislative Session.—The first legislative session of the Territory of Hawaii, beginning March 1, 1901, and ending sixty days later, was a disappointment to American residents in the islands and to those who believed that the territorial act devised by Congress in 1900 would insure a stable and progressive government. Under the practically universal suffrage which Congress enacted for Hawaii, the so-called Home Rule Party, composed of Kanakas and others opposed to American sovereignty, easily gained a majority in the legislature, and its members were said to have spent their time largely in inveighing against Governor Dole and in creating embarrassments for him. On the third day of the session the secretary of the Territory, Mr. Cooper, was ordered to retire from the House, although he was present in accordance with the provisions of the territorial act requiring him to "record and preserve the laws and proceedings of the legislature." Practically no business was transacted at the session, the attention of the legislature, when not directed against Governor Dole, being turned to the consideration of a county government law and the devising of a dog tax. No appropriation bills were even introduced. An extra session of the legislature had therefore to be called on May 8 for voting money to carry on the government. In a message to the senate

the governor informed the members that they had been "wasteful both of time and of money," and that the special session which he would call should be for the passage of the neglected appropriation bills and for that purpose only. In reply, the Home Rule Party sent a petition to Washington asking for the governor's removal, alleging that he had lost the confidence of the majority of the people; that he had not their best interests at heart; and that he had tried to take the heritage of the people from the rightful owners and give it to a favored few. The Home Rule Party stated, in addition, that the governor had exceeded the powers of his office; had appointed his nephew as attorney-general of the island; and had caused a great financial loss to the Territory by ordering the burning of certain parts of Honolulu during the fire of 1899. In the meantime the Republican members of the legislature signed a statement to be sent to Washington, unanimously indorsing the governor.

Territorial Needs.—In his report for the fiscal year ending June 30, 1901, the acting-governor, Henry E. Cooper, asked aid of the national government on behalf of Hawaii for the following purposes: To authorize the conversion of all Hawaiian silver coins, amounting, as originally issued in 1883, to \$1,000,000, into corresponding coins of the United States; to amend the immigration laws (see paragraph Labor Conditions) so far as to allow "the immigration of a limited number of Chinese laborers, conditioned upon their engaging in agricultural pursuits only during their residence in the Territory, and that upon their ceasing to do so that they shall return to their own country;" to authorize the services in Hawaii of an expert forester to report upon the condition of forests and upon the best method of conserving and extending them; to authorize the granting of licenses to direct water from lands where it is valueless to arid sections that are otherwise adapted to agricultural purposes; to authorize the retention by the Territory of a sufficient amount of the receipts of the customs house to pay all judgments awarded by the commission on fire claims.

Territorial Officers.—The territorial officers in Hawaii in 1901 were as follows: Governor, Sanford B. Dole (owing to the illness of Governor Dole, Mr. Henry E. Cooper was acting-governor during part of 1901); secretary, Henry E. Cooper; auditor, H. C. Austin; superintendent of public works, J. H. McCandles; superintendent of public instruction, A. T. Atkinson; commissioner of public lands, J. T. Brown; United States district judge, M. M. Estee; territorial chief justice, Walter F. Frear; attorney-general, E. P. Dole; delegate to Congress, W. E. Wilcox.

Haweis, Hugh Reginald, M.A., Anglican divine and lecturer, died in London, January 29, 1901. He was born at Egham, Surrey, April 3, 1838, and was educated at Trinity College, Cambridge, graduating in 1859. In 1860, while traveling in Italy, he became interested in the revolution and served under Garibaldi at the siege of Capua, several times narrowly escaping death. He was ordained a priest in 1862, and in 1866 he was appointed to the perpetual curacy of St. James, Marylebone. While unusually successful as a preacher, it was as an author and lecturer that he became best known. He was a Royal Institution lecturer, a Lowell lecturer at Boston in 1885, and a delegate to the World's Parliament of Religions, Chicago, 1893. He traveled all over the world to lecture and gather material for books, his itinerary between 1885 and 1895 being about 200,000 miles. His best-known lecture was *Music and Morals* (1871), which he delivered in many cities of the United States in 1893. Some of his writings are: *Thoughts for the Times* (1872); *Arrows in the Air* (1878); and *Christ and Christianity* (5 vols., 1886-87). He was connected with the *Echo*, was editor of *Cassell's Magazine* (1868-69), and contributed many articles to current periodicals, particularly *Memoirs of Garibaldi* for *Cassell's*. His wife, a well-known artist and writer, died in November, 1898.

Hawes, Josiah Johnson, American photographer, died in New Hampshire, August 7, 1901. He was born at Boston, in 1807, and early in life was a painter of oil portraits and miniatures on ivory. When M. Gourod went to Boston in 1841 to explain the daguerreotype process, Mr. Hawes took the American agency for it. He fitted up a photographic studio in 1843, and continued the business until the time of his death, numbering, among his early patrons and friends, Daniel Webster, Holmes Emerson, Longfellow, Whittier, and Kossuth.

HAY. The hay crop in point of value is second in importance in the United States. In 1900 its value was \$445,538,870, as compared with \$751,220,034 for corn and \$323,515,177 for wheat. In 1901 its estimated value was about \$500,000,000. In spite of the drought in several of the hay-producing States, the crop was apparently nearly an average one. The rate of yield in the Ohio Valley is estimated above the average for a series of years, which offsets the lower yield in the Mississippi and Missouri valleys. The shortage was the most serious in Illinois, Missouri, and Kansas, and to a less extent in Iowa and Nebraska. East of the Alleghanies, the hay crop was almost uniformly a large one. The acreage and yield in the principal hay-producing sections, as estimated by the *American Agriculturist*, together with its figures for production in 1900, are shown in the following table:

	Acreage.	Average Yield per Acre, Tons.	Production, Tons, 1901.	Production, Tons, 1900.
New England States.....	3,370,000	1.40	4,718,000	3,666,000
New York	4,405,000	1.30	5,726,000	4,050,000
Pennsylvania	2,585,000	1.25	3,230,000	3,029,000
Ohio	1,397,000	1.43	1,998,000	1,757,000
Michigan	1,174,000	1.26	1,479,000	1,556,000
Indiana	1,260,000	1.31	1,651,000	1,764,000
Illinois	1,656,000	.88	1,457,000	2,165,000
Wisconsin	1,249,000	1.25	1,561,000	1,377,000
Minnesota	1,622,000	1.34	2,173,000	1,577,000
Iowa	4,561,000	1.26	5,747,000	5,989,000
Missouri	1,875,000	.71	1,331,000	2,505,000
Kansas	3,649,000	.75	2,737,000	4,877,000
Nebraska	2,106,000	1.13	2,380,000	2,744,000
South Dakota	2,311,000	1.01	2,334,000	2,064,000
California	2,248,000	1.68	3,777,000	3,000,000
Oregon	573,000	1.52	871,000	1,013,000
Other States	5,979,000	...	7,811,000	7,943,000
Total	42,020,000	1.21	50,981,000	52,006,000

The average yields per acre are the only estimates published by the Department of Agriculture at Washington. The average of the latter for the whole country, 1.32 tons per acre, is slightly higher than that given above. The exports of hay, as computed by F. H. Hitchcock, chief of the section of foreign markets of the Department of Agriculture, were as follows for years ending June 30:

Countries to which Exported.	1900.		1901.	
	Tons.	Value.	Tons.	Value.
United Kingdom	22,175	\$291,464	30,374	\$479,931
Philippine Islands	10,544	162,199	16,693	325,994
British Africa	11,156	192,485	13,331	242,219
Mexico	4,487	50,355	7,374	118,031
Chinese Empire	8	85	9,273	114,243
Canada	4,054	48,530	6,053	100,670
Other countries	20,292	247,623	6,266	97,782
Total	72,716	\$992,741	89,364	\$1,476,870

The imports of hay in 1901, furnished by the same source, were 142,620 tons, valued at \$1,128,610, as against 143,890 tons in 1900, valued at \$1,019,000. These came almost exclusively from Canada. The hay crops of foreign countries are of little interest in this country, and only quite fragmentary data are available for 1901. For the cultivation of brome grass (*Bromus inermis*), see AGRICULTURE.

HAY, ADELBERT STONE, former United States consul at Pretoria, Transvaal, died at New Haven, Conn., June 23, 1901. He was born at Cleveland, O., in 1876 and was educated at Yale University, where he graduated in 1898. In 1899 he was appointed United States consul at Pretoria. He returned to the United States in 1900 and resigned his post in April, 1901. While attending the Yale commencement exercises he was killed by a fall from the window of his room in a hotel. He was the son of Secretary of State John Hay.

HAY, JOHN, secretary of state of the United States, was born at Salem, Ind., October 8, 1838, and graduated at Brown University in 1858. He entered the law office of Abraham Lincoln soon after leaving college and on Lincoln's accession to the Presidency was appointed one of the President's private secretaries, the other being John G. Nicolay (*q. v.*). As private secretary, Mr. Hay had access to practically all of the voluminous diplomatic correspondence carried on during the Civil War with the various European nations, and both on this account and through his necessarily intimate acquaintance with Mr. Lincoln and the war methods and policies which he advocated, Mr. Hay was later enabled to write in conjunction with John G. Nicolay the first exhaustive and, in the main, authoritative history of the Civil War both in its foreign and domestic aspects. Mr. Hay's diplomatic career proper began with his appointment as secretary of legation at Paris, and he then served in the same capacity at Madrid and Vienna, and later became *chargé d'affaires* at Vienna. For some time he was connected with the New York *Tribune*, and leaving that paper became first assistant secretary of state (1879-1881). In 1897-98 he was United States ambassador to Great Britain, and upon the resignation of Secretary Day from President McKinley's cabinet, September 30, 1898, Mr. Hay was nominated

to succeed him as secretary of state. Upon the death of President McKinley, Mr. Hay agreed to retain the state portfolio under President Roosevelt. The Spanish War and the negotiations with the Continental Powers which preceded it brought Mr. Hay into great public prominence, and this prominence was accentuated by the international negotiations which accompanied and followed the Boxer outbreaks in China and by the ratification, through Mr. Hay's efforts, of a new treaty with Great Britain with regard to the proposed Isthmian Canal. In connection with affairs in the Far East, Mr. Hay was the first of American statesmen to bring the United States prominently into the councils of the great nations concerning an affair external, strictly speaking, to the immediate interests of the United States. Mr. Hay gained the nominal consent, at least, of the various Powers interested to use their influence in maintaining the so-called open trade door in China, and he also employed the influence of the United States to reduce the extortionate demands for indemnities made by several of the Powers, and to prevent the official looting of China under more or less plausible pretexts of "necessary retribution." In both these respects, Mr. Hay made the policy of the United States practically identical at any rate for the moment with that of Great Britain and Japan. The Isthmian Canal convention with Great Britain, which was finally ratified by the Senate in December, 1901, followed a long course of negotiation made requisite by the refusal of the Senate to ratify a prior treaty in 1900, radically different in some respects from that finally adopted. Much credit was ascribed to Mr. Hay for being able at once to meet the objections which Great Britain made to the amendments introduced by the Senate in the earlier treaty of 1900, and at the same time to draw up such a new treaty as would be satisfactory to such a difficult body to handle as the United States Senate. He has published: *Castilian Days* (1871); *Pike County Ballads* (1871); a translation of Castelar's *Democracy in Europe* (1872); *Abraham Lincoln: A History* (1890); *Poems* (1890); and *Sir Walter Scott: An Address* (1897).

HAYDEN, CHARLES H., American painter, died at Belmont, Mass., August 4, 1901. He was born at Plymouth, Mass., in 1856. He studied in Boston and Paris. At the Paris Exposition of 1889 he received honorable mention; in 1895 he received the Jordan prize of \$1,500 at Boston, and a silver medal at the Atlanta Exposition, and he was awarded a bronze medal at the Paris Exposition in 1900. Most of Mr. Hayden's work was in landscapes, although his animal studies were also well known.

HAYTI. See **HAITI**.

HEART, WOUNDS OF THE. In April, 1901, an examination was made, with the help of the X-ray fluoroscope, of the heart of Charles B. Nelson, of Cadillac, Mich., who was shot in 1896. The bullet which nearly caused his death was seen in the heart, moving with each pulsation of the organ. In December, 1901, Dr. Nietert, of St. Louis, reported a case of a stab wound of the left ventricle of the heart. Twenty-four hours after the injury he opened the pericardium and emptied it of blood, whereupon the patient recovered consciousness. The surgeon then sewed up the wound in the heart. The patient died a day and a half later of shock, peritonitis, and suppression of urine. Nietert reports 22 other cases of wounds of the heart, all of which went to operation, and seven of which recovered. Ninety per cent. of such wounds without operative interference result in death.

HEDIN, SVEN ANDERS, a Swedish explorer whose explorations in Central Asia from 1899 to 1901 covered the Lob Nor region and part of Thibet, was born in Stockholm, February 19, 1865. He was educated at the universities of Upsala, Berlin, and Halle, and from the last named received the honorary degree of Ph.D. In 1885-86 he made his first journey of exploration, the results of which he published in 1887 under the title, *A Journey from Persia to Mesopotamia*. As a member of the Swedish embassy, he revisited Berlin in 1890, and in the following year traveled in Turkistan. The years 1892-95 he spent in a journey through Asia, penetrating into Thibet, and studying in considerable detail the Lob Nor district. This expedition took him from Orenburg on the Russian frontier through the Chinese empire to Peking. A full account of this trip was published by him in 1898 under the title *Through Asia*.

His latest explorations were begun in August, 1899, and had for their final object the tracing of the sources of the River Indus, in Thibet; but before he penetrated into that region he made a survey of the central region of Turkistan. He organized his caravan at Kashgar and sent it to Yangi-Kul. He himself floated down the Yarkand river from Lailik, and mapped it in 60 large sheets. This trip took three months. He met the caravan at Yangi-Kul and made a ten days' trip to Cherchen across the desert. In 1900 he pushed to the Lob Nor region and located and defined the boundaries of the ancient lake, around the southern shore of which passed the old caravan route, from Central China westward. On the shore of this lake he discovered salt beds. He also discovered the ruins of the ancient city of Altimish-

buluk, and from the evidences of ruined temples and manuscripts left by the Chinese he inferred that this city flourished some 2,000 years ago.

About the end of April, 1901, he set forth from Chaklik, on the southern border of Lob Nor, with 27 camels and 36 horses and mules. His intention was to cross Thibet diagonally from the Chimen-Tag to the sources of the Indus, passing south of Lake Manasarowar. He meant to visit the northern boundary of India, and there (having promised to restore his Cossacks to their native town) to return to Osh by way of Kashgar. The reports of this expedition are somewhat meagre, but apparently he decided to attempt to reach Lhasa, the sacred city of Thibet—an adventure which has been attempted by many explorers, including the American, William Woodville Rockhill, and the Englishman, Henry Savage Landor. The Lamas, who dread foreigners, are adverse to the presence of strangers in their city. They had captured Mr. Landor in 1897 and tortured him. Dr. Hedin disguised himself as a pilgrim and reached a point a few miles from Lhasa. He was then captured, but was well treated by the command of the Dalai Lama. He was released by the Lama, but made a second effort to reach the city, and this time was attacked by 500 soldiers, who destroyed his caravan. He then turned back and reached the British territory at Ladakh. A telegram from him sent to King Oscar of Sweden announced that on the second attack his baggage, including apparently his collections, was lost, but his note books were saved. He arrived at Leh, India, on December 20, 1901.

HELLMUTH, Rt. Rev. ISAAC, former Anglican bishop of Huron, Canada, died at Weston-super-Mare, England, May 30, 1901. He was born near Warsaw, Poland, December 14, 1820, and was educated at the University of Breslau. Born a Jew, he became, upon his removal to England, a Christian, and in 1844 was sent to Canada as an Anglican clergyman. In 1863 he became principal of the Huron Theological College, the endowment for which he collected in person, in 1871 bishop of Norfolk, and a few months later bishop of Huron. In 1883 he resigned his office and returned to England. He was the founder of Hellmuth College, London, Ontario. He wrote *The Authenticity and Genuineness of the Pentateuch*, and *A Biblical Thesaurus*.

HELY-HUTCHINSON, Sir WALTER FRANCIS, who was made governor of Cape Colony in January, 1901, was born in Dublin, Ireland, August 22, 1849. He was educated at Harrow and at Trinity College, Cambridge. After holding various colonial positions he became lieutenant-governor of Malta (1884), governor of the Windward Islands (1889), and governor of Natal (1893). In Natal he was active in inaugurating the system of "responsible government," and in effecting consolidation of that colony with Zululand and the trans-Pongola territories, which occurred in 1897. Upon the transfer of Lord Milner (q. v.) to the governorship of the Transvaal and the Orange River Colony, he was made governor and commander-in-chief of the Cape.

HENLEY, WILLIAM ERNEST, English poet and man of letters, published during 1901, in a review of two new biographies of Robert Louis Stevenson, a criticism of that writer which occasioned much protest. The substance of Mr. Henley's criticism was contained in the sentences: "At bottom Stevenson was an excellent fellow; but he was of his essence what the French call *personnel*. He was, that is, incessantly and passionately interested in Stevenson." Mr. Henley was born at Gloucester, England, August 23, 1849, and was educated in the schools of that town. He has edited *London* (1877-78), the *Magazine of Art* (1882-86), the *Scots Observer* (1888-93), and the *New Review* (1893-98). His published works, poems and essays, show a fine literary quality, and include *Views and Reviews* (1890), *Song of the Sword* (1892), *English Lyrics* (1897), and (with W. Nicholson) *London Types* (1898).

HENSCHEL, LILIAN (BAILEY), concert singer, died in London, England, November 4, 1901. She was born in Ohio in 1860, and studied music under her uncle, C. Hayden, and under Madame Viardot in Paris, and George Henschel, whom she married in 1881. After her marriage she was associated with her husband in vocal recitals and on concert tours throughout Europe and the United States. She was regarded as one of the most charming of soprano "lieder singers," and was exceedingly popular.

HERMITE, CHARLES, French mathematician and professor at the Sorbonne, Paris, died in that city January 14, 1901. He was born in Paris in 1822, and was educated at the Ecole Polytechnique. In 1856 he was elected a member of the Institute of France, and from this time a number of brilliant mathematical discoveries followed in rapid succession. In 1862 Professor Hermite was chosen to the faculty of the Ecole Normale, subsequently succeeding to the chairs of mathematics at the Ecole Polytechnique and the Sorbonne. He is considered the founder of a new school of geometry in France, and his work is well appreciated by mathematicians of all countries.

HERNE, JAMES A. (James Aherne), American actor and playwright, died in New York City, June 2, 1901. He was born at Troy, N. Y., in 1840, and received his first training as an actor in a theatre there. From 1859 to 1878 he played in various companies throughout the United States, and afterward performed the leading parts in plays written by himself. *Hearts of Oak* ran for a number of years, and following this he brought out (1885), *The Minute Men*, and (1886), *Drifting Apart*, both of which proved failures. In *Margaret Fleming* (1890), Mr. Herne reached his highest artistic level, according to some critics, but it was not until *Shore Acres* appeared in the later nineties that he scored another popular success. As a sympathetic and accurate delineator of types of every-day life Mr. Herne occupied a high place on the American stage.

HERZEGOVINA. See BOSNIA AND HERZEGOVINA.

HIRSCH, ADOLPH, Swiss meteorologist, died at Neuchâtel, Switzerland, April 18, 1901. Dr. Hirsch was born in 1830 and served as director of the observatory in Neuchâtel from its foundation in 1859 until his death. In addition to his numerous researches in astronomy and meteorology, he was well known for his work in the extension of the metric system of weights and measures. Dr. Hirsch was a member of the original Commission International du Mètre of 1872, and when the International Committee of Weights and Measures was organized under the terms of the metric convention of 1875 he was made its secretary, a position which he held at the time of his death.

HIRSCH, JOSEPH, French engineer, died in 1901. He was born in 1836, and was trained as an engineer in the Ecole Technique and the famous Ponts et Chaussées. He soon developed considerable talent in engineering enterprises and was employed on various works in France, Alsace, and Austria. One of his early notable works was the Houillères de la Sarre canal, for which he invented special arrangements to regulate the level of the water automatically. He became interested in the iron and steel works of his father-in-law, M. Dreyfus-Dupont, and originated many new and improved methods of operation. Becoming in 1876 a member of the faculty of the Ecole des Ponts et Chaussées, M. Hirsch occupied the chair of "The Steam Engine" for twenty-two years and also lectured on mechanics before the evening classes of the Conservatoire des Arts et Métiers. He held a number of important official positions, being in 1879 a member of the State commission of steam engines and in 1880 engineer-in-chief of the department of purchase and inspector of materials. He was actively interested in the Paris Expositions of 1878, 1889, and 1900, and prepared reports on the machinery exhibited, which were printed by the government. M. Hirsch was made a chevalier of the Legion of Honor in 1878 and an officer in 1900.

HISTORICAL ASSOCIATION, AMERICAN, founded in 1884 and incorporated by congress in 1889, held its annual meeting in Washington in the closing week of 1901. By pre-arrangement the annual meeting of the American Economic Association was held at the national capital at the same time, enabling the members of the two organizations to hold a joint session and discuss matters of mutual interest. The meeting was truly national in the character of its attendance, and from the interest displayed, the outlook for the work in hand was promising. Addresses were delivered by the presidents of both organizations. President Ely, of the Economic Association, discussed the question of *Industrial Liberty*, while President Adams, of the Historical Society, took for his subject *An Undeveloped Function*, in the treatment of which he urged that the Association as a body should take an active part in national politics, so as to secure as far as possible an adherence to sound principles and wise government. A visit of inspection was paid to the Congressional Library, where several papers on European history were read. An interesting matter connected with the visit was the presentation by the librarian, Mr. Putnam, of the outline of a scheme of cooperation, whereby the Congressional Library might be placed at the service of students of history. Among other papers read at the meeting were one by Professor A. Lawrence Lowell on *Party Legislation*, and one on *Economic Interpretation of History*, by Professor Seligman. The drift of Professor Lowell's paper was to show that the cry against the tyranny of party legislation in a great degree was not justified by facts, and that in this country only a small percentage of legislation, either State or national, is partisan. Other very valuable papers were presented at the meeting by Professor Osgood, of Columbia University, and Mr. Gaillard Hunt, of the Department of State. The membership of the Association now numbers 1,600, including 110 life members. President, Alfred T. Mahan, Washington, D. C.; secretary, A. Howard Clark, Smithsonian Institution, Washington, D. C.

HITTELL, JOHN SHERZER, American journalist and author, died in San Francisco, March 8, 1901. He was born at Jonestown, Pa., December 25, 1825, and graduated at Miami University, O., 1843. During the gold frenzy of 1849 he went to California and settled at San Francisco, where he was engaged in newspaper and

historical work. Some of his works are: *Evidences Against Christianity* (1857); *Spirit of the Papacy*; *The Resources of California* (1863); and *History of San Francisco* (1878).

HOBSON, EDWARD HENRY, brigadier-general, U. S. V., died at Cleveland, O., September 14, 1901. He was born at Greensburg, Ky., July 11, 1825, and was educated in the common schools. He served in the Mexican War and with the Union forces in the Civil War. In 1861 he organized and was made colonel of the Fifteenth Kentucky volunteers. He was for a time with General Buell's army, was in command of his regiment at Shiloh, and after various campaigns in Kentucky, Indiana, and Ohio, in pursuit of Morgan's raiders, was mustered out in 1865, with the rank of brigadier-general of volunteers. General Hobson was president of the Mexican War Veterans' Association at the time of his death.

HOCKEY, ICE. See ICE-HOCKEY.

HOFMANN, JOSEF, Austrian concert pianist, concluded his second American tour in 1901. He was born at Cracow, Austria, January 20, 1877, and received his musical education from his father, Casimir, at the Warsaw Conservatory until 1892, after which for two years he was the pupil of Rubinstein at Dresden. His first public appearance was made when he was six years old, and at the age of nine he made a tour of Germany, Denmark, Norway, and Sweden, playing also in Vienna, Paris, London, and (1887-88) in America. From that date until 1894 he studied, and then made his second debut at Dresden, after which he toured Europe again. He has written a number of piano pieces, and enjoys a well-established popularity as a technician and interpreter of delicate music.

HOHENLOHE-SCHILLINGSFÜRST, CHLODWIG KARL VICTOR, Prince von, former chancellor of Germany, died at Ragatz, July 6, 1901. He was born at Rotenburg, Bavaria, March 31, 1819, and was educated in law at the universities of Göttingen, Heidelberg, and Bonn. Entering the Prussian judicial service in 1842, he went from Ehrenbreitstein to Potsdam and thence to Breslau, where he remained until 1846, when he returned to manage his estates at Schillingsfürst. As a Bavarian magnate Prince von Hohenlohe sat in the upper house of the Diet until he went as Bavarian envoy to London in 1849. Brought into prominence by the changes resulting from the Austro-Prussian War of 1866, he became Bavarian premier and was a strong advocate of the plan to unite Bavaria with Prussia and the North German Federation, a stand which aroused great hostility in the anti-Union party, and necessitated his resignation in 1890. From 1871 to 1874 he was a member of the first German *Reichstag* and served as vice-president of that body. In 1874 he was sent by Prince Bismarck as German ambassador to Paris, and during his eleven years of service there he exerted a powerful pacifying influence upon French fears of fresh German hostility. From Paris, Prince Hohenlohe was sent in 1855 to Alsace-Lorraine as governor, one of the most difficult posts under his government. Here the new *Staatthalter* exerted the same influence for harmony that had made him trusted at Paris, one result of which was to secure adequate German representation in the administrative affairs of the province. Upon the resignation of the imperial chancellor, Count Caprivi, in 1894, Prince Hohenlohe became the third German chancellor and prime minister of Prussia. With the rise to influence of Count von Bülow, about 1897, Prince Hohenlohe's power began to decline, and in October, 1900, just prior to the meeting of the last diet, he resigned the chancellorship. "Of Prince Hohenlohe," says the London *Times* in a biographical notice, "it may be said that during his long career of 20 years in the midst of hostile population he has done more than any of his contemporaries to neutralize the bitter memories of the Franco-German War." That was his greatest work. As chancellor he did much to mollify the hostile Agrarians and Social Democrats and was responsible for the accomplishment of important reforms. For his moderate foreign policy, particularly in connection with affairs in China, which was commonly considered to be at variance with that of the emperor, he was sharply criticised by the German press, and to this, probably as much as his advanced age, was due his retirement from public affairs.

HOLLAND. See NETHERLANDS.

HONDURAS, a Central American republic, borders on the Caribbean Sea and touches the Pacific at the Gulf of Conchagua. The capital is Tegucigalpa.

Area and Population.—The 15 departments comprising Honduras have a total area of about 43,000 square miles. In 1901 the estimated population, exclusive of "savage" Indians, was 587,500; it is not unlikely, however, that this estimate is too high. The majority of the inhabitants are of Indian blood. Roman Catholicism is the prevailing religion, but there is no state church. Primary instruction is free, secular, and nominally compulsory. At the beginning of 1901 there were 768 primary schools, with 30,251 pupils enrolled. A "college" is maintained in each of the departments and a private university so-called is maintained at Tegucigalpa and Comayagua.

Government.—The chief executive is a president, who is assisted by a cabinet of five members. The legislative power rests with a congress of deputies. The president for the four-year term beginning February 1, 1899, is Señor Terencio Sierra. The regular army numbers only about 500 men. According to the report of the secretary of war, the total strength of the militia in 1901 was 40,079 men, an increase of 7,726 men over 1899.

Finance.—The monetary standard is silver and the unit of value the peso, which was worth in United States money 45.1 cents on October 1, 1900, and 42.8 cents on October 1, 1901. The principal sources of revenue are customs and taxes on alcoholic liquors. The reported revenue and expenditure for fiscal years were 2,351,240 pesos and 2,378,565 pesos respectively in 1899, and 2,824,131 pesos and 1,662,652 pesos respectively in 1900. The external debt with arrears of interest, unpaid since 1872, amounted in July, 1900, to £18,298,258 (\$89,038,473). The internal debt in 1900 was reported at 1,800,812 pesos.

Industries, Commerce, etc.—The principal industry is agriculture and the leading crop bananas; cattle raising is important. Although the mineral resources, which are unusually great, for the most part are undeveloped, minerals occupy first place among the exports. Among the principal imports are cotton textiles and iron and steel ware. For the fiscal year 1900 imports and exports amounted to 2,416,625 pesos and 5,930,104 pesos respectively. The principal items of export were metals, 1,808,822 pesos; fruits, 1,621,529 pesos, and cattle, 1,286,966 pesos. The leading countries in both the import and export trade are, in order of importance, the United States, Germany, and Great Britain. A line of railway 110 kilometres (68 miles) in length connects Puerto Cortez on the Gulf of Honduras with La Pimienta by way of Pedro Sula. On March 3, 1901, the congress approved a contract with an American company for the construction of a railway from Omoa to a point on the Bay of Trujillo.

HONG KONG, a British crown colony, consists of an island lying off the south-eastern coast of China, at the mouth of the Canton River, and of a strip of the mainland leased from the Chinese government in 1898 for 99 years. The island, which is separated from the mainland by a strait about a half mile wide, has an area of 32 square miles and had a population in 1900 of 261,258, of whom only about 15,000 are Europeans. The leased portion has an area of 376 square miles and a population of about 100,000. The capital, the city of Victoria, commonly known as Hong Kong, has a harbor which is considered one of the finest and best fortified in the world. The port is the headquarters of the British Chinese squadron, which consists of 36 vessels. The imperial garrison numbers 4,000 men, including the Hong Kong regiment. The colony is administered by a governor (Sir Henry A. Blake since 1897), assisted by executive and legislative councils. The revenue, largely the receipts from licenses, taxes, and an opium monopoly, amounted in 1899 to 3,610,142 dollars (Mexican silver dollars, valued January 1, 1901, at 50.9 cents and October 1, 1901, at 46.4 cents). The expenditures for the same period were 3,162,800 dollars, but they are increasing annually much faster than the revenues. The public debt at the end of 1900 was £320,175, mostly incurred for public improvements, some of which are remunerative. Victoria is a free port and the commerce, which consists largely of trans-shipping, is practically part of the commerce of China. The trade is chiefly with Great Britain, the United States, India, Australia, and Germany. The imports from Great Britain in 1899 (based on the Board of Trade returns) were £883,126, and the exports to Great Britain, £2,688,609. Among the principal articles of commerce are sugar, cotton, tea, rice, flour, and opium. In 1900, 18,500,000 tons of shipping, carrying nearly 10,000,000 tons of merchandise and over 2,000,000 passengers, entered and cleared at the port.

During the year 1900 the chief administrative work was the settlement and division of the recently acquired territory on the mainland, a task made difficult by the claims of families and clans. The work on the harbor improvement progressed rapidly and will be completed, it is expected, in 1904-05. The appropriation for this purpose was increased during the year from £575,000 to £1,275,000.

HOOD, ARTHUR WILLIAM ACLAND, British admiral (retired), died at Glastonbury, England, November 16, 1901. He was born at Bath, July 14, 1824, and was educated at the Royal Naval College at Portsmouth. Entering the navy in 1836, he saw his first service on the north coast of Spain. He was present in 1840 at the reduction of Acre on the coast of Syria; in 1857-58 he took part in the China War, winning his promotion to captain; in 1862 he took command of the North American squadron; and seven years later he was made director of naval ordnance. After attaining the rank of rear-admiral he was made, in 1877, one of the Admiralty Board. From 1879 to 1882 he commanded the Channel fleet, and in 1885 he became admiral and first naval lord of the Admiralty, being retired in 1889.

HOPETOUN, Earl of, JOHN ADRIAN LOUIS HOPE, was appointed first governor-general of the Commonwealth of Australia in 1901. He was born in Lincolnshire,

September 25, 1860, and was educated at Eton. In 1885-86 and 1886-89 he was a lord-in-waiting, and from 1889 to 1895 was governor of Victoria. For three years he was paymaster-general, and then became Lord Chamberlain, remaining as such until he was appointed to his present post. Lord Hopetoun was president of the Institution of Naval Architects in 1895-1900, and holds numerous military titles. He has been prominent in the councils of the Church of Scotland. As governor-general he has shown a deep interest in the development of Australia, bearing out the policy of the government, and has apparently acquiesced in the plans of the ministry of Mr. Barton (*q.v.*). See AUSTRALIA, COMMONWEALTH OF.

HOPKINS, EDWARD JOHN, Mus. Doc., English organist, died in London, February 4, 1901. He was born at Westminster, June 30, 1818, and early showed signs of unusual musical ability. At eight he was a chorister at the Chapel Royal, St. James, and after completing his organ studies assumed his first position in 1834, at Mitcham Church, Surrey. Other positions followed until in 1843 he became "Organist to the Honorable Society of the Temple," a post from which he retired on account of old age, in 1898. Throughout his career as organist, Dr. Hopkins remained steadfastly faithful to English church music and methods of composition. He composed many anthems, two of them, *Out of the Deep* (1838) and *God is Gone Up* (1840) being Gresham medal-winners, and also numerous hymns and voluntaries. He wrote (with Dr. Rimbault) *The Organ, Its History and Construction* (1855; and he contributed to Grove's *Dictionary of Music and Musicians*.

HOPS. In his handbook on the *Hop* (New York, 1899), Mr. Herbert Myrick states the principal regions in which the commercial hop crop is grown and the relative average acreage, as follows:

Foreign.	Acres.	American.	Acres.
Germany	160,000	New York	25,000
England	55,000	California	7,000
Austria	37,000	Oregon	15,000
France	7,000	Washington	6,500
Other	11,000	Other	1,000
Total	210,000	Total	54,500

The *American Agriculturist's* estimate of the crop of 1901 (in bales of 180 pounds net) is: Pacific coast, 160,000; New York, 50,000—total, 210,000. The official estimate of the crop of Germany of 1901 is: Acres, 85,493; pounds, 25,143,714—a very poor crop. The section of foreign markets of the United States Department of Agriculture reports the exports and imports of hops for the United States in 1900 and 1901 as follows: Exports: 1900—12,639,474 pounds, valued at \$1,707,660; 1901, 14,963,676 pounds, valued at \$2,466,515. Imports: 1900—2,589,725 pounds, valued at \$713,701; 1901, 2,606,708 pounds, valued at \$851,008. The conditions and methods of hop culture in California have recently been described by Mr. Daniel Flint, a successful hop grower in that State. He points out "the extreme variability and uncertainty on the business side of hop culture." "At 12 cents or less per pound, hop production involves a loss. At 15 to 20 cents, the grower can make a fair living." In two cases in which he kept careful accounts to ascertain the actual cost of hop production he found that in the first instance the picking, curing, and baling of 64 acres cost \$2,200; and in the second the same operations on 40 acres cost \$1,500. "For planting an acre, 2,000 roots will cost \$20, and the expense of planting them is \$2." Chinese, Japanese, Indian and white pickers are employed in California, but the labor supply is often below the demand.

HORTICULTURE. The fruit interests of the United States have grown to enormous proportions. Progress in orchard management, the control of diseases and insects, the harvesting, storage, packing, and shipment of fruit, is evident year by year, and the recognition of the principles upon which successful fruit growing rests is being brought home more forcibly as competition increases. Attempts are being made to extend the market for American fruit abroad. The splendid showing of American products at the Paris Exposition and the favorable comment which these brought forth have shown beneficial effects in the increased demand for American oranges and apples. In 1899 the United States exported 380,222 barrels of apples, valued at \$1,210,459; in 1901 nearly 900,000 barrels were exported, which were valued at considerably over \$2,000,000. The value of the oranges exported during the past year was double that of 1900. The results of trial shipments made by the Department of Agriculture are such as to encourage the belief that there are great possibilities for trade in American fruit abroad.

A good deal of attention has been given in the past few years to the improvement of the ordinary small orchards, means of renovating and bringing them up, and to

the question of orchard management in general. Nearly all the publications of the experiment stations continue to advocate clean cultivation, followed by some leguminous winter cover crop. The results of five years' work at the Missouri Experiment Station show that in those orchards which have been cultivated most the trees have made a larger and more uniform growth and been less affected by drought. Elsewhere it has been shown that neglected and unprofitable orchards can be regenerated and put on a paying basis by ordinary attention to spraying, manuring, and cultivation.

The work of Waite, of the Department of Agriculture at Washington, in showing that many varieties of pears are self-sterile to their own pollen, started a line of investigation with other orchard and small fruits. Waugh, of the Vermont Experiment Station, and a number of other horticulturists, have shown that for all practical purposes native and Japanese plums may be considered self-sterile. A number of varieties of apples, peaches, and apricots are shown to have a tendency to self-sterility and many varieties of grapes are either self-sterile or partly so. These rather surprising results have a very practical bearing in the setting out of new orchards, indicating the advisability of mixing varieties to insure pollination and fruit production.

The generally unsatisfactory condition of the olive industry of California has been the subject of an investigation by the experiment station in that State, which attributes the cause of failure in olive culture to improper selection of soil, neglect of tillage, irrigation, and proper pruning, and insect pests. The competition which the oil has to meet with from cottonseed is also a serious drawback commercially.

Cold storage for fruit has proved so satisfactory and desirable that considerable attention is being given to cheap practical methods of providing it for small growers, and studies are also in progress on the whole question of cold storage—the varieties best adapted to it, whether they shall be put in at once or held for a time, the changes which they undergo, and similar problems. The experiment stations in a number of States are actively engaged in studying these matters.

The advantage of winter irrigation of orchards, at a time when the supply of water is abundant, has been confirmed by a number of years' trials at the Arizona Experiment Station. An application of three or four feet of water from December until March enables peaches and apricots to produce excellent crops without further water for a period of eight months. The results have a very important bearing in a region where fruit growing is assuming considerable importance, and are of course applicable to the warmer irrigated regions in general.

The subject of improvement of fruits and other horticultural plants by breeding and selection is receiving a great deal of attention from scientific workers, as well as from nurserymen and seed growers. Considering what has been done in the past with imperfect knowledge of the principles upon which plant breeding rests, the opportunities seem almost unlimited. Sometimes the object sought is the production of a more hardy plant or one more resistant to attacks of some injurious disease or insect ravages, or of greater adaptability; while in other cases the improvement of native fruits by selection and by crossing with various types is the basis of operation. The interest in this work among experiment station workers has reached a high point, and almost every known fruit is receiving more or less attention. As an illustration of the extent to which it is being entered into it may be mentioned that Hansen at the South Dakota Experiment Station had no less than 100,000 seedlings of various kinds under observation the past year, and crosses and grafts of a great variety were made. The result of these manifold investigations is a more thorough working out of principles, which, aside from the originations themselves, is of very great importance to the advancement of horticulture.

In commercial floriculture there is a continual strife for something which is new and of superior merit. A record-breaker so far as price is concerned was the Lawson carnation, which during the past year is reported to have sold for \$30,000. While the price is generally acknowledged to be much in excess of the actual commercial value of the variety and was associated with a certain amount of sentiment, the flower is regarded as one of the choicest of its kind and has proved a good seller. It is an indication of the strife which there is to produce something better than the best.

One of the notable horticultural features of 1901 was the summarizing by Munson of his more than twenty years' work in the study and improvement of the wild or native grapes of the United States. This important résumé, with the deductions from his experience, was published as a bulletin of the Texas Experiment Station. Aside from his very extensive observation on the natural distribution, preference of soil, resistance to climatic conditions and to phylloxera and various diseases, Munson's methods of breeding grapes are outlined and many of the results secured in

crossing and selection are recorded, thus putting in permanent form the results of his exhaustive work with that fruit.

Among other notable investigations in horticulture during the year may be mentioned the continuation of the classic studies of Daniel, a Frenchman, on the subject of grafting; a thorough study of the chemistry of the apple and its parts, by Browne, of the Pennsylvania Experiment Station; and a system of classification of muskmelons worked out by Rane, of the New Hampshire Station. The results of three years' work by Goff at the Wisconsin Station on transplanting various garden vegetables show that, contrary to the popular belief, transplanting does not promote earliness nor increase the yield. The good effect of chemical fertilizers on roses has been demonstrated by the Indiana Station, and Bailey has shown in experiments in New York that the use of fertilizers on strawberries increased the yield about 2,000 quarts an acre over the average of growers. The experiments in the use of pure or special culture in cider and vinegar making, the best conditions for the fermentation, and the means of controlling these, as carried on by Alwood at the Virginia Station, constitute an important line of investigation on a subject which hitherto has been largely a matter of rule of thumb.

L. C. Corbett, who is in charge of the Arlington Experimental Farm of the Department of Agriculture, has announced the plan of planting extensive collections of varieties of fruit to furnish authentic new specimens for comparative study and guard against duplication of varietal names. Tests of cultural methods and phenological investigations are also to be made.

The inspection of nurseries for the San José scale and other dangerous insects has now been extended in some form to nearly all the States where the matter is of importance, a new law being passed in Connecticut the past year. This inspection affords protection to buyers the country over and has been the means of preventing the dissemination of a variety of insects and diseases. A meeting of the official horticultural inspectors of the various States was held in Washington in November, 1901, being the first general meeting of the kind. The American Pomological Society held its annual meeting at Buffalo in connection with the Pan-American Exposition.

Among the horticultural books of 1901 may be mentioned the third volume of Bailey's *Cyclopedia of American Horticulture*, extending through the letter "Q"; it is expected that the final volume of this work will be issued early in 1902. Somewhat similar in character, though less comprehensive, are Weathers's *Practical Guide to Garden Plants*, and Drury's *Book of Gardening: A Handbook of Horticulture*, both by English writers. An unusual number of books on the landscape and floricultural features of gardening appeared during the year. Among these are *The Century Book of Gardening*, by E. T. Cook; *Gardening for Beginners: A Handbook to the Garden*, by the same author; *The Art and Craft of Garden Making*, by T. H. Mawson; *Gardens Old and New—The Country Home and Its Garden Environment*; *Picturesque Gardens and Ornamental Gardening Illustrated*, by C. Henderson; *Wall and Water Gardens*, by Gertrude Jekyll; and *Old Time Gardens Newly Set Forth*, by Alice M. Searle. The first four of these are published in England. Most of these books are profusely and very beautifully illustrated. Bailey has added another volume to his excellent Rural Science Series on *The Principles of Vegetable Growing*, and P. H. Mell has revised White's *Gardening for the South*. F. A. Waugh has made a valuable contribution in a book on *Plums and Plum Culture*, and another on *Fruit Harvesting, Storing, and Marketing*. A new and very attractive periodical has appeared under the title of *Country Life in America*, edited by L. H. Bailey, and devoted to the present growing interest in country life from both the ideal and the practical points of view.

HOSHI TORU, Japanese statesman, was assassinated at Yokohama, June 21, 1901. He was born at Tokio in 1850, and entered politics at an early age. As a leader of the extreme progressive party, Hoshi Toru became prominent in Japan, attacking the abuses of the government in addresses all over the empire. Twice he was imprisoned for his utterances, but upon the adoption of the Constitution of 1889 he was pardoned by the Mikado and went to Europe to study the systems of government there. Hoshi Toru was minister to the United States in 1896-98, resigning to enter the lower house of the Japanese parliament. When Marquis Ito formed his new cabinet in 1900, Hoshi Toru was given a place, but resigned after a short time, in consequence of bitter and persistent attacks upon his official integrity. He was largely responsible for the treaties now in force between Japan and the western Powers.

HOSKINS, Sir ANTHONY MILEY, British Admiral (retired), died near Dorking, England, June 21, 1901. He was born at North Perrot, England, September 1, 1828, and received his early education at Winchester, entering the navy in 1842. After participating in numerous campaigns, including the China War of 1857-58, he became in 1879 a rear-admiral, and was one of the lords of the Admiralty (1880-

82). Upon his promotion to vice-admiral in 1885 he served four years more as a lord of the Admiralty, and upon rising in rank (1891) to admiral was made first naval lord of the Admiralty, which office he held until his retirement in 1893. He was made a G. C. B. in 1893.

HOSPITALS. The New York State Hospital for the care of Crippled and Deformed Children, at Tarrytown, was opened May 17, 1901. New buildings connected with the German Hospital, New York City, were opened December 7, 1901. They contain modern rooms for private patients, with electric bells and light and telephone in each room, and are provided with an ice plant. The new Lying-in Hospital in New York City, the gift of Mr. J. Pierpont Morgan, was reported, in December 1901, nearly ready for occupancy. The annual report of the old foundation demonstrates conclusively the need of the institution. During 1901 there were 50,278 births in the borough of Manhattan, New York City, of which number 24,917 were reported by physicians and 25,311 by midwives. The new building of Gouverneur Hospital, New York City, was opened January 5, 1901, accommodating 115 patients and replacing the old structure. The Beth Israel Hospital Association is collecting funds for a new Jewish Hospital, to be erected at Jefferson and Cherry streets, New York City, at a cost of \$115,250 on land costing \$75,000. By the will of the late James D. Sarven, the Presbyterian Hospital and St. Luke's Hospital, New York City, and the Tarrytown (N. Y.) Hospital each received \$59,140 in 1901. An emergency hospital will be built at Bath Beach, N. Y., now part of the borough of Brooklyn. The New York legislature appropriated in 1901 a sum of money for the erection of the first pavilions of the New York State Tuberculosis Hospital to be located at Ray Brook, N. Y., about four miles east of Saranac Lake. The Pennsylvania Hospital, Philadelphia, celebrated its 150th anniversary on May 11, 1901. This hospital was founded under an act of the Provincial Assembly, February 7, 1751, as a result of the efforts of Dr. Thomas Bond, who secured the cooperation of Benjamin Franklin, and who formed with Dr. Phineas Bond and Dr. Lloyd Zachay the first board of visiting physicians. A new building for the Newport, R. I., Hospital is projected by Mrs. Cornelius Vanderbilt as a memorial of her late husband. It will contain a ward and rooms for paying patients and accommodation for out-patients, and will cost \$200,000. Funds are being solicited for the Muhlenberg Hospital projected for Plainfield, N. J. New buildings will be begun in 1902 for the barracks hospital and crematory of the State Quarantine Board of Pennsylvania, to be erected at Marcus Hook, Philadelphia. These buildings will be devoted to the isolation of cases of contagious disease, and will have accommodations for 600 beds. Early in January, 1901, the Central State Hospital, Petersburg, Va., with a capacity for 160 patients, was opened for inspection. The cornerstone of the new Mt. Sinai Hospital, New York City, at Fifth avenue and One Hundredth street, was laid June 1, 1901. The hospital will cost \$1,300,000. The new gynæcologic pavilions of the Broca Hospital, Paris, were recently opened. They are under the direction of Dr. Pozzi, first professor of gynæcology in the Paris Faculty of Medicine. In the four wards are 44 beds, and there are a few small wards each containing 2 or 3 beds, besides 6 private rooms. The facilities for running water, electric light, and sanitary appliances are modern. The latest improvements in the construction of sterilizing rooms, anæsthetizing rooms, and instrument rooms have been adopted, and the amphitheatre for students and visitors is the best in France.

HOT AIR TREATMENT. While the hot air treatment is less fashionable than in 1900, and less extravagant claims are made for it, its efficacy in chronic joint affections was very evident during 1901. Hot air can be administered without difficulty; with the Betz apparatus its use is not very costly, and the time consumed in its application is not great. It is a valuable analgesic, without depressing after-effects. It is positively curative in some conditions, in conjunction with drug treatment. It encourages and stimulates repair and absorption, as also elimination. It is a valuable nerve sedative.

HUBBARD, RICHARD B., former governor of Texas, died at Tyler, Tex., July 12, 1901. He was born in Walton County, Ga., November 1, 1832, and graduated at Mercer University, in Georgia, in 1851. After studying law at the University of Virginia and at Harvard, he went to Texas and began to practice his profession at Tyler. He was appointed, under President Buchanan, United States district attorney for western Texas, but resigned in 1858 to become a member of the State legislature. In the Civil War he recruited a Confederate regiment, of which he was chosen colonel. After serving two terms as lieutenant-governor (1874-76) he was in this latter year elected governor. In 1885 he was appointed by President Cleveland United States minister to Japan.

HÜBNER, ERNEST WILLIBALD EMIL, German philologist and archæologist, died in Germany, February 21, 1901. He was born at Düsseldorf, July 7, 1834, and was

educated at Berlin and Bonn. After traveling in Italy and France for further study (1855-57), he was sent by the Berlin Academy of Sciences to Spain and Portugal (1860-61) to examine the antique monuments there and to study Latin inscriptions. For the same purpose he traveled, in 1866-67, through England, Scotland, and Ireland. The results of his travels he recorded in the two volumes prepared for the great collection of the Berlin Academy, the *Corpus Inscriptionum Latinarum*, under the titles, *Inscriptiones Hispaniae Latinae* (1869), with *Supplementum* (1892), and *Inscriptiones Britanniae Latinae* (1873). As a continuation of these studies, he published the *Inscriptiones Hispaniae Christianae* (1871) and *Inscriptiones Britanniae Christianae* (1876). Another of his publications, *Die antiken Bildwerke in Madrid* (1862), proved to be exceedingly important, for it led to the opening of Spain and Portugal for the first time to archaeological research. In 1859 Dr. Hübner became a teacher at the University of Berlin, where he was made extraordinary professor in 1863, and full professor in 1870. He established in 1866 the magazine, *Hermes*, which he conducted until 1881, and for several years edited the *Archäologische Zeitung*, contributing to both periodicals numerous articles on philological and archaeological subjects. Worthy of mention are Dr. Hübner's exhaustive article, *Römische Epigraphik*, in Ivan Müller's *Handbuch* (1886), and his *Bibliographie der Klassischen Altertumswissenschaft* (1889).

HUGHES, ROBERT WILLIAM, American editor and judge, died at Abingdon, Va., December 10, 1901. He was born in Powhatan County, Va., June 6, 1821, and was educated at Caldwell Institute, N. C. From 1852 to 1857 he was editor of the Richmond (Va.) *Examiner*, and in 1858-59 he was with the *Washington Union*. He was again editor of the *Examiner* from 1861-65, and a year later was in charge of the *Richmond Republic*, going afterwards to the *Richmond State Journal*. In 1872-73 he was United States attorney for the Western District of Virginia, and for twenty-four years following 1874 he was United States judge for the Eastern District of his State. Judge Hughes wrote a five-volume series of *Law Reports*; *The Currency Question from a Southern Point of View* (1879); *The American Dollar*; and the lives of Generals Floyd and Johnston, in Pollard's *Lee and His Lieutenants* (1867).

HUIDEKOPER, RUSH SHIPPEN, M.D., American veterinarian, died in Philadelphia, December 17, 1901. He was born at Meadville, Pa., May 3, 1854, and was educated at Phillips Exeter Academy and in the medical school of the University of Pennsylvania. After some years of study in France, he was appointed professor of veterinary science at the University of Pennsylvania in 1883, and later he filled the chair of internal pathology and contagious diseases at the New York College of Veterinary Surgeons. In the Spanish-American War, Dr. Huidekoper was chief surgeon to the first army corps, with the rank of lieutenant-colonel, and was with the army in Porto Rico.

HUNGARIAN LITERATURE. History, Biography, and Criticism.—Hungarian patriotism is so prone to find expression in the form of historical monographs that it is somewhat of a surprise to find only a single work of high order to record in this department for 1901. This is *The Hungarian Nation's Past and Present*, by the popular writer Elek Benedek, better known hitherto as a novelist and critic. Benedek's chief gift is his command of an easy and entertaining narrative style; and whether he is writing critical essays, or short tales of rural life, such as his *Pigeons* and *Village Bohemians*, or fairy plays for children, like his *Prince Unique*, which enjoyed a small triumph two seasons ago, he never fails to hold attention. This same charm of style pervades his new history, so that although thoroughly scholarly in spirit, it is nevertheless as entertaining as a novel. A work of some interest to students of social life is Géza Nagy's *History of Hungarian Costumes*, lavishly illustrated with carefully prepared plates, the expense of which was borne in part by the government. A comprehensive picture of Hungary's recent progress in industry, education, and the various arts and sciences may be found in *Hungary at the Paris Exposition, 1900*, a bulky volume edited by Mór Erdélyi.

It is hard to say whether the biographical or literary interest predominates in Jókai's *Romance of My Life*; for not only is the long and varied career of Hungary's most widely known novelist a fascinating theme in itself, but as narrated by Jókai himself it is so freely interspersed with anecdotes as to be a rich storehouse of curious reminiscences of the leading Hungarian authors, journalists, and statesmen of the nineteenth century. Another writer well known in Hungary, although he has never before published anything in book form, is the lawyer and journalist, Károly Eötvös. His widely scattered writings, criticisms, essays, fiction, etc., have at last been collected and issued in four volumes. In the field of criticism, however, the two most important works of the year are Bernat Alexander's *Diderot Studies*, and Béla Lázár's *Yesterday, To-Day, and To-Morrow*. Professor Alexander, who occupies the chair of philosophy at the University of Budapest, had already published a selected Hungarian edition of Diderot's works, and his new volume serves only

to give added proof of his intimate knowledge and keen comprehension of his subject. Professor Lázár's essays, which fill two volumes, are devoted to contemporary writers, both foreign and native. It is only natural that Hungarian authors should receive the giant share of his attention, and it is in his careful and well-judged estimates of his countrymen that the value of the book lies. A volume of considerable æsthetic value is Tamás Szana's *Hundred Years of Hungarian Art*. The author is already well known for his admirable biographies of such artists as Izso, Marko, and Janos Janko, and his new work has been warmly praised for its breadth of knowledge, soundness of judgment, and unerring good taste.

Fiction and Poetry.—The two novelists best known outside of Hungary are undoubtedly Jókai and Kálmán Mikszáth, the author of *St. Peter's Umbrella*. Besides his autobiography, Jókai has found time to write a new volume of short stories, *A Tombstone Album*—a fair year's work for a man of seventy-five. For a number of years, Mikszáth also has confined himself to the short story, but his latest work is a two-volume novel, *A Strange Marriage*, which many critics are inclined to place highest on the list of fiction for 1901. The central motive is the unhappy married life, culminating in divorce, of a couple who have been married against their will by an unscrupulous clergyman who had previously seduced the girl. Although written in Mikszáth's usual vein of extreme romanticism, the novel possesses undeniable strength. Ferencz Herczeg, who shares with Sándor Bródy the greatest popularity among the younger group of novelists, has gathered together under the title *Arianna*, sixteen short stories, remarkable for their subtle psychology and keen observation of life. Herczeg's chief activity of late has been turned in the direction of the drama, and his recent historical play, *Ocskay, the Brigadier*, attained a success of a very unusual sort at the Comedy Theatre of Budapest. Herczeg's special talent in fiction has always lain in the interpretation of life in small towns and villages. In sharp contrast is the work of Tamás Kóbor, a writer of pronounced decadent tendencies, who has undertaken a series of novels dealing with Hungarian life on the comprehensive plan of Zola's Rougon-Macquart series. The first of these novels, entitled *Budapest*, depicts the immorality of the Hungarian capital with surprising frankness, yet at the same time with a convincing sincerity that stamps the work as one of high merit. Other novels, whose titles at least should be here included, are *Swamp*, by István Bárony, analyzing an emotional woman's morbid love; *That Ass Domokos*, a novel of aristocratic life in Transylvania, by Deszö Malonyay, the biographer of the artist Munkácsy; *The Roaring Solitude*, by the same writer, a collection of entertaining stories of the artist colony at Barbizon; and two volumes by Geza Gardonyi, *Twelve Novelleltes*, and an historical novel, *Eger Stars*, drawn from the local annals of Eger.

The poets have not been active this year. The one notable exception is *A Poet's Fate*, by Emil Makai, one of Hungary's best lyric poets, whose metrical drama based upon the life of the Hungarian Faust, *Learned Professor Hatvany*, attracted considerable attention in 1900.

HUNGARY. See AUSTRIA-HUNGARY.

HUNT, WILLIAM HENRY, secretary to the colonial government of Porto Rico after May, 1900, was on July 23, 1901, appointed by President McKinley to succeed Mr. Charles H. Allen as governor of that island. He was born at New Orleans, La., November 5, 1857, and was educated at the Hopkins Grammar School, New Haven, Conn., and at Yale University. In 1881 he was appointed collector of customs for Montana and Idaho, leaving this post to become attorney-general of Montana (1885-87). In 1889 he was elected a member of the Montana legislature, and in the same year was made a judge of the district court of the first judicial district of that State. This position he held until 1894, when he became a justice of the Montana Supreme Court, and in 1900 he was made secretary to Governor Allen of Porto Rico.

HUTTON, WILLIAM RICH, American civil engineer, died at Woodlands, Md., December 12, 1901. He was born at Washington, D. C., March 21, 1826, and was educated in private schools of that city. The first important engineering work under his charge was the Washington aqueduct (1862-63). As chief engineer, he was engaged on the Chesapeake and Ohio Canal (1869-71), and remained as consulting engineer until 1880, when he went to New York City. He served as consulting engineer of the new Croton Aqueduct, of the Colorado Midland Railway, and of the Harlem River (Washington) Bridge, until 1889, when he became chief engineer of the Hudson River Tunnel. He was a member of several civil engineering societies and served on the United States board of engineers on obstructions in the Columbia River.

HYDROPHOBIA. See RABIES.

HYGIENE. Russia proposed in 1901 to install appliances for baths and douches on all railway trains running long distances. In New York City the penalty for ex-

pectorating in public conveyances is a fine not exceeding \$500, and notices to this effect were posted in 1901, replacing those that simply denominated the act a misdemeanor and forbade it. A few convictions under this hygienic provision of the sanitary and civil codes were made in 1901, and in one case a fine of \$30 was imposed. The evil is decreasing slightly. From the *London Lancet* it is learned that the regulations of the new Imperial Council of Hygiene in Germany were published in 1901. "The Council has been instituted in conformity with the new laws relative to epidemic diseases to be a consulting body in connection with the Imperial Health Office. The members are elected by the federal council, and the president and vice-president are appointed by the imperial chancellor. . . . The imperial authorities and also the authorities of the individual confederated states have the right to send representatives to the meetings. The Council is authorized to send commissioners to make inquiries in any part of the empire where intervention in hygienic matters seems to be necessary. There will be nine special committees of the Council, the functions of which will be to take cognizance of the following subjects: (1) Public health, including hygiene of dwellings, ventilation, etc.; (2) hygiene of food; (3) water supply; (4) hygiene of factories; (5) epidemic diseases; (6) hygiene of hospitals; (7) the pharmacopeia; (8) hygiene of shipping; and (9) veterinary hygiene. The 'plenum' of the Council will meet only when convoked by the imperial secretary of state for the interior. The proceedings are not public. . . ." The Imperial Council of Health is only a consulting body, without executive functions. Of the members of the Council the following prominent names may be mentioned: Professor von Bergmann, of Berlin University; Professor Binz, of Bonn; Professor Buchner, of Munich; Professor Flügge, of Breslau; Professor Fränkel, of Halle; Professor Gaffky, of Giessen; Professor Gerhardt, of Berlin; Professor Robert Koch, the bacteriologist; Professor Löffler, of Greifswald; Professor van Noorden, of Frankfurt; Professor Rubner, of Berlin; and Professor von Ziemssen, of Munich. See MILK; GAS, ILLUMINATING AND FUEL.

ICE-HOCKEY. Next to Canada, the northeastern States of America continue to be the stronghold of ice-hockey. In Canada, the game's national home, the Victoria team of Winnipeg won the Stanley Cup of 1901, the emblem of the world's championship, in a contest with the Shamrock team of Montreal, by a score of 6-4, in 2 games. These two were the leading teams of Canada, followed by the Ottawas. The Ottawa team won the Canadian Amateur Hockey League series, the Wellington's, of Toronto, the Ontario Hockey Association games, and the Victorias the championship of the Manitoba and Northwest Hockey Association.

In the United States the Crescent Athletic Club won the American (formerly New York) Hockey League championship, with 8 out of 10 games. The record of the other teams was: New York Athletic Club, 7 out of 10; St. Nicholas Skating Club, 4 won, 3 tied, 4 lost; Brooklyn Skating Club, 4, 1, 6; Hockey Club of New York, 3, 1, 6; Quaker City Hockey Club, 2, 1, 8. The Western Pennsylvania Hockey League series, played in the ice-rink at Pittsburg, were won by the Pittsburg Athletic Club, 10 games won, 2 tied, 1 lost; Keystone, 6, 2, 5; Duquesne Athletic Club, 4, 1, 7; Bankers, 2, 1, 9. Brown University won all 4 games in the Intercollegiate series, followed by Yale, with 3 games won; Princeton, 2 games; Columbia, 1 game; and Pennsylvania, no games. In the final play-off between the two leading teams, Yale defeated Brown in 2 games, thus winning the championship of 1901. Neither Cornell nor Harvard is a member of the Intercollegiate Association. The former, however, defeated Pennsylvania, Princeton, and Swarthmore; while Harvard defeated Brown and Yale. During the annual visit of Canadian teams Queen's University on January 9 defeated Pittsburg Athletic Club, 1-0, and on March 16 the Victorias defeated the same team, 6-2; in New York, March 22-23, the Ottawas defeated the New York Athletic Club, 3-1, and an All-New York team, 5-1. In interleague hockey, the champions of the two American leagues mentioned above met at Pittsburg on March 1, Crescent Athletic Club winning 1-0.

ICELAND, an island constituting a Danish colony, lies about 250 miles east of southern Greenland. Its area is 39,756 square miles, and its estimated population over 75,000. The capital is Reykjavik. The head of the administration is a minister appointed by the Danish crown. Local executive authority is vested in a governor, and the legislative power in an assembly, the *Althing*, consisting of 30 elected members and 6 appointed by the crown. Trade is largely with Denmark, the imports from and exports to the mother country in 1899 being 2,403,000 kroner and 2,660,000 kroner respectively. The krone is worth 26.8 cents. In April, 1901, it was reported that a large coal-bed had been discovered at Nordfjord on the east coast. It was feared that the quality was not sufficiently good to render profitable competition with Northumbrian coal, but further investigations were to be made.

For many years the Icelanders have striven for a greater degree of self-government. The measure looking toward home rule, which was proposed in 1900 by Dr. Guðmundson, the leader of the Moderate party, was laid before the *Althing*, which

met at Reykjavik on July 1, 1901. This bill was a compromise between earlier Radical measures and those proposed by the Conservative Danish government; it received, however, the approval of the last Conservative ministry. It provided for the appointment of a special minister for Iceland, responsible to the *Althing*, who must be an Icclander and reside at Reykjavik during the parliamentary session and have a seat in the ministerial council at Copenhagen during the rest of the year. The *Althing* refused to approve the bill in its original form, but amended it so that it had a more Radical character; in this form it was passed. News then came of the formation of a new Radical ministry in Copenhagen under the leadership of M. Deuntzer. The Radical leaders in Iceland, believing that still more could be obtained from the new administration, sent two prominent members of the *Althing* to confer with M. Deuntzer and his colleagues. The main point at issue between Dr. Guðmundson's scheme and the proposals of the Icelandic Radicals is the position of the minister for the colony. The Radicals want this minister to reside at Reykjavik all the year, and object to his having a seat in the Danish ministerial council at Copenhagen, since such a position, they assert, would be likely to make him dependent on political movements in Denmark. The Radicals, however, would not refuse to submit to the institution of an Icelandic agency in Copenhagen, or to the Danish government's exercising the right of veto in cases of legislation affecting foreign relations or the Danish constitution.

ICE YACHTING. The winter of 1900-01 was the most unsatisfactory for ice yachting in the last ten years. Some club races on the Hudson and Shrewsbury rivers were held, but none decided the season's pennants. In the West snow interfered with the sport.

IDAHO, a northwestern State of the United States, has a land area of 84,290 square miles. The capital is Boise City. Idaho was organized as a Territory March 3, 1863, and admitted to the Union July 3, 1890. The population in 1900 was 161,772, while in June, 1901, as estimated by the government actuary, it was 169,000. The largest city in 1900 was Boise City, with a population of 5,957.

Finance.—The receipts of the State treasury for the calendar year 1900 amounted to \$1,052,462.34, and the expenditures were \$859,105.87, leaving in the treasury \$324,337.17. For the reconstruction of State institutions \$168,000 were expended out of a total of \$198,000 raised for that purpose by the sale of bonds. The State debt at the end of the year was \$641,500, of which \$541,500 was bonded. The State tax rate for the year 1901 was \$4.75 per thousand dollars. The total value of property in the State, as returned for taxation, was \$51,440,758.19. Since the beginning of the year all floated indebtedness has been paid and sufficient cash remains in the treasury to pay all expenses until the 1902 tax levy is received. The rate of this levy has been fixed at \$4.25 per thousand dollars of assessable property.

Industries.—The census reports of 1900 show a healthy growth in manufacturing interests during the last thirty years. In that time, the population increased from 14,999 to 159,147, while the average number of industrial wage-earners rose from 265 to 1,477, embracing in 1900 0.9 per cent. of the total population. In that year, the amount of actual capital, exclusive of capital stock, invested in the 591 plants reporting, was \$2,941,524; the gross value of products, inclusive of material re-used in the process of manufacture, \$4,020,532. The manufactures of Idaho depend upon her forests, mines, and farms, mining and agriculture being the principal industries, while the manufactures are chiefly such as are incidental to these two. The making of flouring and grist mill products, valued in 1900 at \$832,207; car construction and repairs, valued at \$523,631; carpentry work, valued at \$152,963; blacksmithing and wheelwrighting, valued at \$191,712; and the making of cheese, butter, and condensed milk, valued at \$116,056, are important.

Forests and Forestry Products.—The manufacturing of lumber and timber products is the principal industry of the State, with a product in 1900 valued at \$937,665. In 1893 there were 7,000,000 acres of timber land in Idaho, a supply which has only begun to be worked. Owing to the large supply of timber, this industry has developed greatly in the last decade, the value of the products having more than doubled in that time.

Labor Laws.—A law similar to those passed in Illinois (*q.v.*) and Missouri (*q.v.*) was enacted by the Idaho legislature, providing for the creation of a labor commission to act as a State Board of Arbitration. The Board was to consist of two persons, one of whom should be identified with labor interests and should himself have been an employee for at least six years preceding his appointment, while the other should have been an employer for at least six years, and the two commissioners should be of opposite political parties. Whenever a strike occurred affecting at least fifty persons, the commissioners were directed to offer their services as arbitrators. If the offer were accepted, both parties must bind themselves to abide by the award. For purposes of arbitration, the court was to consist of the two commissioners and of the judge of the county court in which the strike occurred.

If the parties to the strike declined to accept the services of the commission, the commission was directed nevertheless to make an examination of all the facts and to send a report to the governor. In this examination the committee was given power to call witnesses and compel the production of information, and might associate with them for this purpose the attorney-general of the State. An employer, however, was given the right to stipulate that if he himself freely informed the commission of facts which, if made public, would damage his business, then those facts should not be made public. Strikes or impending labor troubles involving less than fifty and more than twenty-five persons were also placed under the jurisdiction of the commission, provided the services of the commission were solicited by either of the parties in the dispute. A constitutional amendment was voted by the legislature to be submitted to the electors providing that the legislature might have power to pass special laws for the health and safety of employees in factories, smelters, mines, and ore reduction works. A law for the regulations of employment bureaus enacted that every manager of such a bureau should deposit \$5,000 as security against fraud and misrepresentation.

Other Enactments.—Congress was asked to pass the pending bill continuing the exclusion of Chinese laborers from the United States. An act was passed empowering the common council of every city and village to establish and maintain a public library and reading-room, and to levy annually therefor a tax not exceeding one mill on a dollar. A State library commission was also created to aid and advise librarians starting or improving libraries, and to have the management of the traveling libraries of the State. A joint legislative resolution was passed stating that the construction and operating of railroad lines in the State opened up mineral wealth, great timber forests, and rich agricultural land, and therefore the following railroads engaged in construction work in Idaho were especially commended by the legislature: the Pacific and Idaho Northern, the Idaho Midland, the Idaho Northern, and the Boise, Nampa and Owyhee. School laws enacted provided that the school board of any district might establish free kindergartens for children between three and six, and another law provided that wherever tuition, living, and other expenses were paid by the State or by the United States, children eligible to attend these schools should attend them until they were eighteen years of age. Congress was petitioned not to adopt any policy which might lead to the leasing of the public domain for grazing purposes; for it was stated that much of Idaho was arid, and that a large part of the water used for irrigation purposes passed through the public domain and would no longer be available if these domains were used for grazing purposes. Congress was applied to under article 5 of the constitution to propose a convention to adopt a constitutional amendment for the direct election of United States Senators. Congress was also petitioned not to give its assent to the pending Grout Oleomargarine Bill (see OLEOMARGARINE), for stock raising was stated to be the largest industry of Idaho, engaging the most capital and employing the most people. The Grout Bill by limiting or destroying the oleomargarine industry would gravely affect the live-stock industry, and therefore Congress was asked to substitute for the Grout Bill the so-called Wadsworth Bill, prescribing that oleomargarine should be sold by the retailer only in original packages. A bill passed by the legislature but vetoed by the governor was intended to relieve women of jury duty. The governor's attitude on this matter was that as women voted, there was no reason why they should not also do court duty. Another and more important bill which finally failed of passage was suggested by the experience of the State with the Coeur d'Alene rioters. This bill provided that the governor might, on application of the proper county officers, send militia to any part of the State where rioting was in progress, and that he should immediately thereafter call the legislature in special session to adjust the difficulty, and his proclamation of martial law should not be effective for a longer period than thirty days.

State Officers.—Governor, Frank W. Hunt, Democrat, elected for two years, term expires in January, 1902; lieutenant-governor, Thomas F. Terrell; secretary of state, C. J. Bassett; auditor, Egbert W. Jones; treasurer, John J. Plumer; attorney-general, Frank Martin; superintendent of education, Permeal French; commissioner of agriculture and inspector of mines, Martin H. Jacobs.

Supreme Court: Chief justice, Ralph P. Quarles, Dem.; associate justices, Isaac N. Sullivan, Rep., and Charles O. Stockslager, Dem.

Congressional Representatives (57th Congress). In the House—Thomas L. Glenn, Fusionist, from Paris. In the Senate—Henry Heitfeld (until 1903), from Lewiston, elected as a Populist, but later affiliating with the Democrats, and Fred T. Dubois (until 1907), Democrat, from Boise City.

ILLINOIS, a central State of the United States, has an area of 56,650 square miles. The capital is Springfield. Illinois was organized as a Territory, March 1, 1809, and admitted as a State, December 3, 1818. The population in 1900 was 4,821,550, while in June, 1901, as estimated by the government actuary, it was 4,930,000.

The populations of the five largest cities in 1900 were: Chicago, the second largest city in the United States, 1,698,575, an increase of 598,725 since 1890; Peoria, 56,100; Quincy, 36,252; Springfield, 34,159; and Rockford, 31,051.

Finance.—The receipts of the treasury for the calendar year 1901 were \$7,836,093.95, expenditures, \$7,304,152, leaving in the treasury \$1,849,616.50. Illinois has no State debt. The State tax rate for 1901 was five mills per \$1.00 valuation. The total value of State property as returned for taxation was \$809,733,405.

Industries.—The census returns for 1900 show that Illinois, which in the value of its manufactured products, ranked fifteenth in the United States in 1850, was in 1890 and 1900 the third in the Union. The population during the half century increased from 851,470 to 4,821,550, while the average number of industrial wage-earners increased from 11,559 to 395,110, embracing in 1900 8.2 per cent. of the entire population, as against 1.4 per cent. of the population in 1850. In 1900 there was invested in the 38,360 industrial industries reporting, a capital of \$776,829,598, exclusive of capital stock; at the same time the gross value of the manufactured products was \$1,295,571,105, while the net value, exclusive of materials re-used in the process of manufacture was \$840,216,206. The high rank of Illinois as a manufacturing State is due both to its proximity to abundant coal and iron supplies and to its transportation facilities, which make it the natural distributing centre between the East and the West. Railroads from all important eastern cities converge in Chicago, as do also several of the great lines to the West and South. In 1900 there were 10,997 miles of railroad in Illinois, a larger mileage than was shown for any other State in the United States. Besides its railroad facilities, however, Chicago, the greatest manufacturing city, is situated on Lake Michigan, while the Mississippi River, affording communication with the entire Mississippi Valley, borders the State on the west. Slaughtering and meat packing is the most important industry in the State. Its products in 1900 were valued at \$287,922,277, or 22.9 per cent. of the total value of the products of the State. Chicago is the great live-stock market for the West and Northwest, and the industries dependent on the animals have been largely stimulated by inventions by which all the by-products of slaughtering and meat packing are now utilized. The manufacture of foundry and machine-shop products ranks second in the industries of the State, with products valued in 1900 at \$63,878,352, an increase during the decade of \$24,980,238, or 64.2 per cent. The abundance of cheap iron afforded by the mines of the Lake Superior region has largely stimulated the manufacture of iron and steel, whose products in 1900 were valued at \$60,144,081, an increase during the decade of \$21,133,030, or 54.2 per cent. The manufacture of liquors is the fourth industry in the State with products valued in 1900 at \$57,941,897. Peoria is the centre of this industry, and has become the largest producer of whiskies and high wines in the United States. The manufacture of agricultural implements, whose increase has followed the development of agriculture in the State, had products in 1900 valued at \$42,033,796, a gain since 1890 of \$17,424,136, or 70.8 per cent. The next largest industries in the State in the order of their financial importance are: printing and publishing, with products valued at \$39,449,032; the manufacture of men's clothing, with products valued at \$37,278,717; flouring and grist mill products, with a value of \$31,006,294; the manufacture of steam railroad cars, with products valued at \$24,845,606; the manufacture of glucose, with products valued at \$18,122,814; railroad shop work, with products valued at \$16,580,424; furniture manufacture, with products valued at \$15,285,475; cheese, butter, and milk manufactures, with products valued at \$12,879,299. Chicago, the great manufacturing centre of the State, had products in 1900 with a gross value of \$888,786,311, or two-thirds of all the manufactured products of the State. In the cities of Bloomington, Peoria, and Quincy, the value of products has slightly decreased during the decade. In Joliet, on the other hand, the value of products has increased from \$12,732,933 to \$27,765,104, or 118.1 per cent.

Legislation.—A considerable portion of the time of the Illinois legislature was devoted to redistricting the State as regards congressional and State senatorial districts. As the law was finally passed, 18 of the 25 congressional districts were so distributed as to make certain, it was believed, in ordinary times a Republican majority. Of the 18 Republican districts, 7 were assigned to Cook County, that is, to Chicago, leaving the Democrats only 3 in that city. Of the 56 State senatorial districts, 36 were arranged as Republican. There was said to be little difficulty experienced in placating the Democratic minority in the House in regard to these districts, for no compromise with them was attempted, the main contention arising as to what power should be given to the Cook County representation led by Mr. Lorimer, of Chicago. A resolution for a constitutional amendment limiting Cook County's representation in the legislature to one-third of the entire membership was adopted by the Senate, but was defeated in the House by the aid of some of the rural members. Among general laws passed by the Illinois legislature was one appropriating \$250,000 for the erection of suitable buildings at the St. Louis Fair in

1903, and appointing a committee of fifteen, of whom nine were Republicans, to have charge of Illinois interests there. A law was passed appropriating \$150,000 for the repairs and maintenance of the Illinois and Chicago Canal, \$50,000 to be used at once in the discretion of the canal commissioners, and \$100,000 to be held as a reserve fund. An act was passed providing for the establishment of a State home for delinquent boys. It was directed that this establishment should be under the authority of seven trustees and a superintendent, the inmates should be given a common-school education as far as might be, and should be taught such trades and employments, including agriculture and horticulture, as would fit them for the ordinary employments of life. The Board of Trustees was also directed to make regulations for placing boys in employment or in private homes or returning them to their own homes wherever possible. Kidnapping was made punishable for life or for not less than five years, depending upon the aggravation of the offense. Hazing was made punishable by a fine of not more than \$500 or imprisonment for six months. A labor act provided that no person under the age of 16 should be employed more than 60 hours in any week. All establishments subject to factory inspection where girls and women were employed, were directed to provide suitable seats for the use of the girls and women, and to permit the employees to use them when not necessarily engaged in their active duties. An act very similar to that passed in Missouri (*q.v.*) gave the State Board of Arbitration important new powers, as follows: "Whenever there shall exist a strike or lockout, wherein in the opinion of the majority of the Board the general public shall appear likely to suffer injury or inconvenience with respect to food, fuel, or light, communication or transportation, or any other respect, and neither party will consent to submit the dispute to the State Board of Arbitration, then that Board having made due effort to effect a settlement by conciliatory means, may proceed of its own motion to make an investigation of all the facts, may make public its findings with such recommendations to the parties involved as in its judgment will contribute to a fair and equitable settlement of the differences. And in the prosecution of the inquiry, the Board shall have power to issue subpoenas and compel the attendance and testimony of witnesses as in other cases." Laws passed relating to taxation and corporations provided that bequests to religious, charitable, and educational purposes should be exempted from the inheritance tax; that the tax rate, exclusive of State, school, road, and bridge taxes and a tax on bonded indebtedness where that bonded indebtedness was more than 10 per cent. of its assessed valuation, should be limited to 5 per cent. of its assessed valuation of property; and title insurance companies previously free from any form of supervision were placed under the jurisdiction of the State auditors, with somewhat liberal provisions as to the deposits required of these companies and with no requirement for a reserve fund. A bill of sweeping import passed by the legislature was vetoed by the governor on the ground that it was of doubtful constitutionality in some of its aspects. This bill, said to be the first of the kind ever passed in the United States, gave the State auditor supervision over the accounts and bookkeeping of the State and of every political subdivision thereof, and instructed the governor to establish a uniform system of public accounting.

State Officers.—Holding office in 1901 and through 1902. Governor, Richard Yates, Republican, elected for four years, term expires in January, 1905; lieutenant-governor, William A. Northcott; secretary of state, James A. Rose; auditor, James S. McCullough; treasurer, M. O. Williamson; attorney-general, H. J. Hamlin; adjutant-general, J. N. Reece; superintendent of insurance, Henry Yates; superintendent of education, Alfred Bayliss.

Supreme Court: Chief justice, term one year, ending June, 1901, Carrol C. Boggs, Dem.; chief justice for term ending June, 1902, Jacob W. Wilkin, Rep.; associate justices, Benjamin D. Magruder, Rep., James H. Cartwright, Rep., John P. Hand, Rep., Joseph N. Carter, Rep., James B. Ricks, Dem., and Carroll C. Boggs (after June, 1901), and Jacob W. Wilkin (before June, 1901).

Congressional Representatives (57th Congress). In the House—Republicans: James R. Mann, from Chicago; Henry S. Boutell, from Chicago; George E. Foss, from Chicago; Albert J. Hopkins, from Aurora; Robert R. Hitt, from Mt. Morris; George W. Prince, from Galesburg; Walter Reeves, from Streator; Joseph G. Cannon, from Danville; Vespasian Warner, from Clinton; Joseph V. Graff, from Peoria, and George W. Smith, from Murphysboro. Democrats: John J. Feeley, George P. Foster, James McAndrews, and W. F. Mahoney, from Chicago; J. Ross Mickey, from Macomb; T. J. Selby, from Hardin; Ben F. Caldwell, from Chatham; Thomas M. Jett, from Hillsboro; Joseph B. Crowley, from Robinson; James R. Williams, from Carmi, and F. J. Kern, from Belleville. In the Senate—William E. Mason (until 1903), from Chicago, and Shelby M. Cullom (until 1907), from Springfield—both Republicans.

ILLINOIS, UNIVERSITY OF, at Champaign, Ill., was opened in 1868. The State University had in 1900-01 an instructional force of more than 300, this being

an increase of about 33 per cent. The student attendance for 1900-01 was 2,505, an increase of more than 250. The registration for the fall of 1901-02 has increased to more than 2,900. During 1901 the State appropriations were increased to \$912,000 for the biennial period, and two gifts of \$25,000 each were made by private individuals. During the year three new buildings were completed, and two more well advanced towards completion. These are an hydraulic laboratory, a laboratory of applied mechanics, the mechanical engineering wood-shop, a gymnasium, and a chemical laboratory. A School of Commerce and a School of Dentistry have been added to the institutions associated in the university, which now comprise in addition to these the College of Literature and Arts, the College of Science, the College of Engineering, the College of Agriculture, the College of Medicine, the School of Art and Design, the School of Library Science, and the School of Pharmacy.

IMMIGRATION. The report of the commissioner-general of immigration shows that the total ascertained alien immigration to the United States in the year ending June 30, 1901, was 562,868. Of this number, 487,918, an increase over the preceding year of 39,346, were steerage passengers, while 74,950 were classed together as "other alien passengers." In 1899 the relative proportion between the sexes was about 2 female immigrants to 3 males; in 1900 this proportion abruptly changed to 2 male immigrants to 1 female, and the latter proportion was maintained in 1901. Of the entire number of steerage immigrants, 117,587 were unable to read or write, 3,058 could read but not write; 204,860 brought less than \$30 each, and 56,312 brought more than \$30 each. As regards destination, 167,241, or more than one-third of all the immigrants, were bound for no farther place than New York. Immigrants to the number of 41,789 were bound for Massachusetts; 30,509 for Illinois; 23,344 for New Jersey; 12,925 for Connecticut; 11,601 for California; 13,754 for Ohio; 99,456 for Pennsylvania; and 10,818 for Michigan. The countries sending the largest number of immigrants to the United States were Austria-Hungary, 113,390; Italy, including Sicily and Sardinia, 135,996; the Russian empire and Finland, 85,257; Sweden, 23,331; the United Kingdom, 45,546; and the German empire, 21,651. Immigration from Asiatic countries decreased by 4,373, the number of immigrants for the fiscal year 1900, being 17,946, and for 1901, 13,593. This decrease was represented almost entirely by the reduced number of immigrants from Japan, the number of immigrants in 1900 being 12,635, and in 1901, 5,269. Of the more than forty races that contributed to the steerage immigration of 1901, ten races furnished 86 per cent. of the total number of 487,918. Those races and the percentage of the total immigration which each race furnished, is shown in the subjoined table, and for purposes of comparison, the number of immigrants furnished by each race in the preceding year is also given.

Race.	Number in 1900.	Number in 1901.	Percentage in 1901.
Italian (Southern).....	84,346	137,807	28
Hebrew	60,764	58,098	12
Polish	46,938	43,617	9
Scandinavian	32,952	40,277	8
German	29,682	34,742	7
Irish	35,607	30,404	6
Slovak	29,243	29,343	6
Croatian and Slovenian.....	17,184	17,928	3
English	10,897	13,488	3
Magyar	13,777	13,311	3
All Others	87,182	68,903	14
Total	448,572	487,918	100

In commenting upon the uneven distribution of the immigrants by races, and the preponderating number who belonged to a few races, the commissioner of immigration stated in his annual report that in order that these aliens might really become a part of the body politic of the United States, some legislation should be enacted by Congress that would give the Bureau of Immigration power to distribute the immigrants throughout the country in accordance with the industrial laws of supply and demand instead of allowing them to congregate as at present in the great city centres, each race or nationality establishing its distinctive colony, maintaining its alien language and sentiments, and furnishing the inflammable material which in times of political or social unrest might be ignited into dangerous conflagrations. At the same time, moreover, a proper distribution of these aliens throughout the country would do away with some of the most perplexing of municipal problems and would also be of value to the development of the vast area of uncultivated land in the West. In this same connection, speaking of the impossibility of getting rid of undesirable immigrants under present laws, the commissioner recommended that the

time of probation during which immigrants might be deported if found undesirable persons, should be extended from one to five years. Attention was also directed by the commissioner to the fact that a part of the existing laws with reference to the exclusion of Chinese laborers from the United States would expire by limitation on May 5, 1902. That is to say, if Congress should not reenact laws prescribing the procedure for the exclusion of the Chinese, the Department of Immigration would be without means of enforcing the provisions of the convention with China of December 8, 1894, which defines those Chinese persons who cannot enter the United States, and which convention does not expire until 1904 (see UNITED STATES, paragraph Chinese Exclusion). During 1901 there was much discussion of what measures, if any, should be taken to debar such aliens as were or might become anarchists. A discussion of this subject will be found in the article ANARCHY.

IMMUNITY. See SERUM THERAPY.

INDIA, BRITISH, comprises all that part of the peninsula of Hindustan and of Burma (*q.v.*) which is directly or indirectly under British rule, but in a popular sense includes also certain countries, as Nepal (*q.v.*), which are beyond its borders, but are under the control or protection of the governor-general of British India.

Area and Population.—The total area of the British possessions in India is 1,560,160 square miles, of which 655,695 square miles are included in the Native States. The population, according to the census of 1901, was: British India proper, 231,085,132; Native States, 63,181,569—total, 294,266,701, an increase of 4.44 per cent. in the decade 1891-1901 for British India, and a decrease of 4.34 per cent. in the same time for the Native States, the net increase during the decade being 2.42 per cent. The actual increase in ten years was 6,949,653, but by deducting the various tracts not enumerated in 1891, the proportionate increase is brought down to 4,283,069, or only 1.49 per cent. increase, as compared with 11.2 per cent., the increase between 1881 and 1891. The populations of the largest cities in 1901 were: Calcutta, 1,121,664; Bombay, 770,843; Madras, 509,397; Hyderabad, 446,291; Lucknow, 263,951; Delhi, 208,385; and Benares, 203,095. Of these, Bombay, Lucknow, and Benares have decreased considerably in size in the past decade. Ethnically the population of British India is a conglomeration of innumerable groups and families, the largest element being the Aryo-Indian, which numbered, in 1891, 195,460,000. Other considerable groups are the Dravidian, a non-Aryan group, numbering in 1891, 52,960,000; the Tibeto-Burman, 7,290,000; the Kolarian, 2,960,000; and the Aryo-Iranian, 1,330,000. There are in all 118 languages and dialects spoken, of which twenty are used by more than a million each. English, in 1891, was spoken by 238,499. According to religious belief, the population was divided (1891) as follows: Hindus, 207,731,727; Mohammedans, 57,321,164; Buddhists, 7,131,361; Christians, 2,284,380.

Popular education in India is making rapid advances; the government expenditure for public instruction in 1898-99 was 36,215,530 rupees. At the head of the educational system are the five universities of Calcutta (2,721 matriculates in 1898), Madras (1,515), Bombay (1,042), Punjab (1,082), and Allahabad (637), which, although merely examining bodies, have numerous colleges affiliated with them. The enrollment March 31, 1899, in 169 colleges, was 21,006, and in 149,779 public and private schools, 4,336,815.

Government.—The administration of the British empire in India is in the hands of a secretary of state for India, a cabinet minister, responsible to Parliament, who is assisted by a council of not less than ten members, the principal duty of which is to control the Indian budget. The supreme authority in India, both executive and legislative, is vested in the governor-general in council. The council of the governor-general consists for executive purposes of five ordinary members and the commander-in-chief of the forces in India, and for legislative purposes is expanded by the addition of sixteen additional members. This council has the power, subject to certain restrictions, to make all the laws for British India proper, and for British subjects within the native states. For administrative purposes that part of India directly under British control is divided into nine great provinces, the last having been organized in November, 1901; each is under a governor, a lieutenant-governor, or a chief commissioner. These provinces are Madras, Bombay, Bengal, the Northwest Provinces with Oudh, the Punjab, Burma, Assam, the Central Provinces, and the new trans-Indus province on the Northwest frontier. The governors of Madras and Bombay are assisted by executive and legislative councils. Within the province the unit of administration is the district, of which there are 250 in India, each in charge of a collector, or deputy commissioner, whose duties are executive, magisterial, and fiscal. The present governor-general of India is Lord Curzon of Kedleston, who succeeded the Earl of Elgin in 1898.

The motive of the government control in the native states occupying even one-third of the total area of India, varies greatly, and is exercised usually through a

political resident, who assists the native prince. The princes manage their own internal affairs, but have no power to make war or peace, and can maintain only a limited army. Some, but not all, pay tribute to the government, which controls all their external relations.

The army in India is composed of both British and native troops. It is under a commander-in-chief, Sir A. P. Palmer since March, 1901, who has a seat in the governor-general's council. It is divided into the four departments of Punjab, Bengal, Madras, and Bombay, and consisted (1901) of 219,543 officers and men, of whom 145,834 were native troops, with British officers.

Finance.—The revenue is derived chiefly from a land tax, stamp taxes, taxes on opium and salt, customs, excise, provincial rates, and the earnings of public utilities owned or controlled by the government. The expenditure is largely for the administration, civil and judicial, army, railways, irrigation and road-building, famine relief, and interest on the public debt. The revenue for the fiscal year ending March 31, 1900, was £68,637,164, and the expenditure £65,862,541, leaving a net surplus of £2,774,623. The principal items of revenue in that year were land tax, £17,205,056; opium and salt tax, £10,252,445, and railways (gross receipts), £14,653,223. The chief expenditures were railways, including interest and subsidies, £16,511,089; army, £14,885,226; administration, £10,782,588; interest on debt, £6,674,637; and famine relief, £2,098,848. The fiscal year 1900-01 showed a surplus, notwithstanding large expenditures for famine relief, of £1,671,000, and the estimated surplus for 1901-02 is more than £2,000,000. The public debt on March 31, 1901, was £210,321,000.

The value of the Indian silver rupee has been stable since 1899, at 1s. 4d. (32.4 cents). The coinage of rupees, which for some years after 1893 almost ceased, was very large in 1900-01, and the profit on the coinage was set aside as a special gold reserve fund to be used in maintaining the rate of exchange between Great Britain and India. The fund amounted in September, 1901, to £3,000,000.

Industries.—About 80 per cent. of the population of India is engaged directly or indirectly in agriculture. The state is the landlord, letting out the land at a fixed annual rental. Two systems of tenure prevail, the *samindari*, prevalent chiefly in Bengal and the Northwest, where single proprietors or brotherhoods possess large estates which they sublet, and the *rayatwari* tenure, common in Madras and Bombay, in which petty proprietors hold directly from the state and cultivate their own lands. Agricultural methods are still crude, although the government has established bureaus of agriculture in every district, and there has been great improvement in the past decade. Rice, wheat, and other grains, cotton, jute, tea, tobacco, opium, sugar cane, indigo, and oil seeds are the chief products. The acreage of the principal crops in 1899 was: Rice, 74,754,045; wheat, 20,255,111; other grains, 87,111,350; cotton, 9,178,060; and sugar cane, 2,755,887. The wheat crop of 1901 was estimated in July at 6,600,000 tons, an increase of 1,750,000 tons over the previous year. The cotton crop of 1901, according to a United States consular report, was estimated at 1,442,384 bales, as against 760,646 bales in 1900. The estimated acreage, too, was 13,325,487, an increase of more than 1,500,000 acres over 1900. The principal manufacturing industries are the weaving of textiles, and metal and pottery work, which it is estimated give employment to 20,000,000 persons. Extensive coal deposits exist, but are as yet little developed. There are more than 80,000 square miles of forest reserve worked by the state.

Commerce.—The chief exports of India are cotton and cotton yarn, jute and jute goods, rice, tea, skins and hides, seeds, opium, and indigo. The principal imports are cotton, oils, metals, sugar, machinery, and hardware. After remaining almost stationary for several years on account of the plague and famine, the volume of commerce increased in the year ending March 31, 1901, almost £10,000,000 over the previous years. The total sea-borne trade for 1901 increased over 1900 as follows: Imports (1900), £64,185,144; (1901), £70,313,900; exports (1900), £78,026,473; (1901), £81,327,872; total trade (1900), £142,211,617; (1901), £151,641,772. Trade was distributed among the principal countries as follows: Great Britain, £53,825,000; China (Hong Kong and treaty ports), £9,597,000; Germany, £7,882,000; the United States, £6,273,000; France, £4,750,000. The values of the most important exports in 1901 were: Rice, £8,813,000; hides and skins, £7,656,000; jute (raw), £7,245,000; cotton, £6,752,000; tea, £6,367,000; opium £6,304,000. In the first five months of the fiscal year 1901-02 great increase in all branches of trade were recorded, the increase in merchandise exported being 22 per cent. over 1900-01. The number of vessels entering and clearing at Indian ports in 1900-01 was 8,302, having a tonnage of 8,269,430. The frontier land trade in 1901 amounted to Rs. 70,992,963 for imports and Rs. 65,706,943 for exports.

On submitting to Parliament his trade and finance reports, for the fiscal year 1901, Sir George Hamilton, secretary of state for India, said: "Since the territories of the East India Company passed over to the authority of the crown, I doubt if any secretary of state has been able to make a more satisfactory statement."

Communications.—The number of miles of railway open for traffic on March 31, 1901, was 25,156, of which 1,387 miles were opened in 1900-01. In addition, the construction of 2,019 miles has been sanctioned. The existing lines represented an expenditure at the end of 1900 of £200,047,000, of which £147,471,000 was represented by standard gauge roads. The gross receipts of the state railways in 1900 were £14,653,223, and the state expenditures, including construction and annuities, £16,511,089. At the close of 1900 about 17,000 miles were owned by the state, over 11,000 of which were operated by companies. The remainder of the lines are owned by guaranteed and assisted companies and native states. In October, 1901, the government sanctioned the Baluchistan railway from Quetta to Nushki on the route to eastern Persia, which when completed will be of great military importance, and it is hoped will help to decrease Russian influence across the Northwestern frontier.

HISTORY.

Famine.—The improvement of conditions in the districts where famine has prevailed, was so marked during 1901 as to give hope that a succession of good crops would check it entirely. The numbers of persons on famine relief on January 1, 1901, was 233,000. The greatest number receiving relief during the year was reached in August, when the total was 588,000, as compared with 6,356,000, the highest figure for 1900. The number in receipt of relief decreased rapidly after September 1, and in December less than 75,000 were on the government lists. The Famine Relief Commission reported that there were 1,000,000 deaths during the famine year 1900, three-fourths of them in the Bombay presidency. The commission recommended greater elasticity of revenue collection, the establishment of agricultural banks, encouragement of land improvement, expenditures for irrigation works, and education of the cultivators.

New Frontier Province.—A new province on the Northwest frontier was created by Lord Curzon and his council in November, 1901. The new province comprises Peshawar, Kohat, Bannu, and Dera Ismail Khan, four trans-Indus districts of the Punjab, with the adjoining tribal country of Dir, Swat, Chitral, and Khyber. The province is under an agent of the Indian government, whose status is similar to that of the political agent in Baluchistan. The change was practically sanctioned during Lord Lytton's vice-royalty (1876), when General (Lord) Roberts was to have been placed in charge, but the Afghan War caused an abandonment of the scheme. It is expected that the organization of the province will strengthen the government in its management of the unruly tribes.

Border Disturbances.—There was some fighting during 1901 with the Mahsud and Waziri tribes inhabiting the mountainous region between Punjab and Afghanistan. The Waziris have been hostile since 1894, and in the latter part of 1900 a blockade of their country was declared, shutting them off from communication with the neighboring tribes. Finally, in May, 1901, an agreement was reached by which the blockade was raised, whereupon the Waziris broke their pledges and fighting was resumed. In November, 1901, the blockade was again established and punitive operations undertaken.

INDIA, FRENCH, the French possessions in East India, consisting of five separate districts, or *dépendances*, combined for administrative purposes into one colony. The divisions are Chandernagore, an inland town on the Hoogly River, 17 miles north of Calcutta, completely surrounded by British territory; Yanam, north of Madras, on the east coast of British India, Pondicherry and Karikal, two coast districts south of Madras, and Mahé, on the west coast. Their total area is 205 square miles, and their population in 1901 was 273,175, of whom only about 1,000 were Europeans. The chief settlement and seat of the colonial government is Pondicherry, which has an area of 115 square miles and a population of 182,000. The colony is administered by a governor, assisted by an elective general council, and it is represented at Paris by a senator and a deputy. The revenue and expenditure for 1900 amounted to Rs. 1,135,678 and the expenditure of France for the colony, according to the budget of 1901, was 494,083 francs. The rupee is worth 32.4 cents and the franc 19.3. The imports of Pondicherry and Karikal in 1899 amounted to 4,661,938 francs and the exports, chiefly ground nuts and oil seeds, 9,253,144 francs. There are 23 miles of railway in the colony.

INDIANA, an east central State of the United States, has an area of 36,350 square miles. The capital is Indianapolis. Indiana was organized as a territory July 4, 1800, and admitted as a state December 11, 1816. The population in 1900 was 2,516,462, while in June, 1901, as estimated by the government actuary, it was 2,552,000. The population of the four larger cities in 1900 were: Indianapolis, 169,164; Evansville, 59,007; Fort Wayne, 45,115; and Terre Haute, 36,673.

Finance.—The receipts of the treasury for the year ending October 31, 1901, were \$7,358,140.84; expenditures, \$7,129,493, leaving in the treasury \$642,292.32. On December 31, 1901, the State debt was \$4,204,615.12, all bonded. Five hundred thou-

sand dollars was paid on the debt during the year. The State tax rate for 1901 for all purposes was 2.9 2-3 mills per \$1.00, made up as follows: For general expenses of State, 1.5 2-3 mills; in addition for State debt, .3 mills; for schools, 1.1 mills.

Industries.—The growth of manufacturing industries in Indiana has been largely coincident with the great extension of railways in the State; for there are few navigable waterways for transportation, and they do not reach, broadly speaking, either large sources of supply or large markets. Since 1850 the population of the State has increased from 988,416 to 2,516,462, or 154.6 per cent., while the average number of industrial wage-earners has increased from 14,440 to 155,956, or 980 per cent., embracing in 1900, 6.2 per cent. of the entire population as against 1.5 per cent. in 1850. In 1900 the total amount of capital invested in the 18,015 mercantile establishments reporting was \$234,481,528, exclusive of capital stock; at the same time, the gross value of the products was \$378,120,140, while the net value, exclusive of articles re-used in the process of manufacture, was \$258,357,627. The discovery of natural gas in Indiana in the counties extending, broadly speaking, from Indianapolis to the Ohio border, has greatly stimulated manufactures in the last ten years by the abundance of cheap fuel afforded. In 1899, Indiana produced a greater quantity of natural gas than any other State, while in the production of petroleum it ranked fourth, and in coal production, sixth. The leading industry of the State is that of slaughtering and meat packing, with products valued in 1900 at \$43,862,273, an increase of \$15,948,433, or 57.1 per cent. during the decade. The city of Hammond, in the northwest corner of the State, near Chicago, is the leading slaughtering and meat-packing centre of Indiana. Indianapolis is next in importance, and Ft. Wayne has also some large establishments. The manufacture of flour and grist mill products is second among the industries of the State, and had products in 1900 valued at \$30,150,766. The manufacture of liquors follows that of grist milling in importance, having products in 1900 valued at \$22,738,105. The increase in the value of products during the decade was \$13,060,132, or 134.9 per cent. A great part of the increase in this industry is shown in the manufacture of distillates, in which corn raised largely in Indiana is used. Lumber and timber products in 1900 were valued at \$20,613,724. The forests of Indiana contain hardwood timber, which is comparatively of great value, but the timber supply is diminishing and hardwood logs are brought from Kentucky and Tennessee. The typical wood products manufactured in Indiana are of a very high grade, such as carriages, wagons, furniture, and agricultural implements. Although iron ore is not found in Indiana in paying quantities, many factories have been established of late years in the natural gas belt, and the growth of the iron and steel industry in the State shows a larger absolute increase during the decade than any other. In 1890 the value of these products was only \$4,742,760, while in 1900 it was \$14,595,721, thus showing an increase of 307.7 per cent. Another industry, whose large growth is attributable to the utilization of natural gas, is that of glass. In 1890 the value of the glass manufacture was \$2,995,409, while in 1900 it was \$14,757,883, an increase of 392.7 per cent. Many glass plants have been attracted from other States by the inexpensiveness of natural gas as fuel, and the products of these establishments embrace a large variety of the goods, including plate and other window glass, cathedral glass, lamp chimneys, lamp globes, fruit jars, and tableware. The manufacture of carriages and wagons, for which Indiana has long been noted, had products in 1900 valued at \$12,742,243, an increase since 1890 of \$4,493,370, or 54.5 per cent. The value of the products of other large industries in Indiana in 1900 was as follows: railroad-shop work, \$10,242,422; railroad cars, \$9,006,577; furniture, \$8,769,509; agricultural implements, \$6,415,081; and newspapers, \$6,093,191. The largest manufacturing city of the State is Indianapolis, with manufactured products in 1900 valued at \$68,607,579, an increase since 1890 of 88.3 per cent. Terre Haute shows the most rapid growth, the value of its products having increased from \$13,720,529 in 1890 to \$27,784,619 in 1900, or 102.5 per cent.

Corporation Laws.—One of the many acts passed by States in recent years to curb trusts was that of the Indiana legislature of 1901. By this act the following acts of a corporation were declared to be unlawful and void: First, the refusal of a corporation to furnish its articles at a reasonable price when needed by any manufacturer; second, the charging of a manufacturer more than a fair market price for any goods; third, any action affecting or intending to affect the selling out or closing down of any manufacturer. Domestic corporations disobeying these provisions were to forfeit their charters, and foreign corporations disobeying the provisions were to be prohibited from doing any further business in the State. Moreover, the agents, officers, or directors of the corporations who had been responsible for the prohibited actions were to be punished personally by fine or imprisonment or both. Another act for the curbing of express companies doing business in the State prohibited these companies from granting "unjust and unlawful discriminations;" and discriminations were defined in the act to include "the granting of any credit, privileges, terms,

usages, facilities, or advantages to any one person, carrier, company or combination of companies, that were not granted to all other responsible carriers or companies." All express companies not incorporated under the laws of the State could do business in Indiana only by first paying in addition to all other lawful taxes one-tenth of one per cent. of the gross capitalization of the company. Express companies were also prohibited from entering into any contract in the form of a trust or otherwise in the restraint of trade, to hinder or obstruct any other express company, to form a monopoly, or to delay the transportation of any goods. Any person injured by an express company violating these provisions might recover threefold the damages actually sustained. An act to offset the very liberal laws passed by several States, as for example Connecticut (*q.v.*) in 1901, authorizing the incorporation on easy terms of companies intending to do business in other States than that of their incorporation, provided that no foreign corporation should conduct in Indiana a trust or investment business calling for instalment payments or deposits of money from outsiders, or should issue stocks and bonds, without authority from the auditor of the State. But to obtain this authority a foreign corporation should first give its written consent to have its finances examined by the auditor of State whenever and so often as he should deem advisable, and it should moreover deposit with the auditor \$25,000 for the first year it did business and for every year thereafter it should deposit securities approved by the auditor of State equal in amount to the corporation's liabilities to the citizens of Indiana, and the money or securities so deposited should be held by the auditor for the benefit of Indiana citizens in case of the company's insolvency. A more general act passed with regard to foreign corporations provided that all such companies should maintain an office in the State, should designate an agent upon whom process might be served, should file a certified copy of their articles or certificate of incorporation with the secretary of State, should pay the same fees and taxes on the amount of their capital represented by business done in the State, as was required of domestic corporations, and should engage in no business other than that expressly authorized in their charter. Moreover, such companies were forbidden to mortgage or encumber their real or personal property in Indiana to the injustice or exclusion of any creditor or corporation in Indiana, and it was further provided that no mortgage of any foreign corporation, except railroad and telegraph companies, given to secure a debt created in any other State, should take effect as against any person or corporation of Indiana until the liabilities due to any citizens of Indiana at the time of recording the mortgage should be satisfied.

Labor Laws.—A sweeping law intended to prevent employees, when injured by the negligence of an employing company, from losing the full damages which they were entitled to under the common law, provided that all contracts made between an employer with an employee, whereby the employer was released from liability for damages for injury resulting from negligence, should be null and void. Another act to protect wage-earners provided that all checks, tickets, tokens, or other devices issued by merchants in payment for the assignment or transfer of wages of employees in coal mines should be at once payable, not in merchandise or any other commodity, but in lawful money of the United States. An act whose purpose appeared to be the extermination of all trade in convict-made goods provided that persons or corporations regularly selling convict-made goods should pay an annual license fee of \$500, and that all goods or merchandise made in whole or in part in any penitentiary, prison, or reformatory should, before being exposed for sale, "be branded, labeled, or marked convict made." An act of advantage for unskilled laborers provided that a minimum wage rate of 20 cents an hour should be paid to all workmen employed on public works of the State, county, city, or town. Another act providing for the sanitary condition of bakeries and other food-producing establishments prescribed rules for the health of employees, prohibited the employment of persons with communicable diseases, and provided for the proper storing of food, etc.

Primaries.—The much mooted primary election reform bill in Indiana passed, but in a much more modified form than had been at first proposed. The original bill passed by the House made direct primaries compulsory in one county and optional in all, and the primaries of all parties were to be held at the same time and under sworn election officers. The bill passed by the Senate, on the other hand, provided for separate primaries and partisan supervision, and while the House bill had provided for direct nominations, the Senate measure required the election of delegates to a nominating convention. The Senate bill was finally accepted by the House and under it the convention system is preserved, and direct nominations are made optional, the decision being left to the party leaders. Primary elections of the different parties were to be held at different times, thus making illegal voting possible; the law is to apply to only two counties and the expense of the primaries is to be borne by the party organizations instead of, as had been proposed, by the State. The law as enacted provides that in all counties having cities of 50,000 or more, the officers of the political parties, to be called precinct committee men, are to be chosen

by ballot at least twelve weeks before the election. The precinct committee men are then to determine whether candidates shall be elected by primary vote or at a nominating convention. If by nominating convention, then each precinct shall elect delegates, but "the number of delegates to which each precinct shall be entitled shall be determined by the Board of Primary Election Commissioners." If in counties in which there is no city having a population of 50,000 or more the central committee of the county, township, city, or town, as the case may be, decides to nominate candidates under the provisions of this act by a direct vote of the electors at a primary election or by delegates to a convention, such primary election may be held under the law.

Other Acts.—A stringent act to suppress the practice of healing by Christian Scientists, but to permit that practice by osteopaths under specified conditions, provides that no one shall be entitled to practice medicine who has not graduated from a regular medical school; that is to say, such a person may not heal or attempt to heal diseases of mind or body or to advertise a willingness to do those things or to use in connection with his or her name, the word Doctor, Professor, or Healer; provided, however, that persons may practice osteopathy upon the passing of a medical examination in all respects like that of a regular medicine examination except as to materia medica. An act for the preservation of forests in the State creates a State board of forestry to consist of five members, whose duty it shall be to collect and disseminate information regarding forests, timber lands, timber culture, and to recommend plans for the establishment of State forest reserves. Gas companies are required to furnish their patrons with meters that are properly tested and in good order, and placed in such a position that the patrons can at any time see the meter dial, and payment shall be made to the companies in strict accordance with the quantity of gas or oil furnished as shown by the dial. An act defining railroads for the purpose of taxation includes under railroads every kind of street railroad, subway, or elevated railroad, and makes the general laws of railroad taxation in the State applicable to them. An act for educational purposes requires the levy of a tax of one cent on the dollar in all cities of 6,000 or more for the purposes of providing a fund for the support of free kindergarten schools. An act for the safety of railroad employees and passengers prescribes that signal lights shall be placed upon all steam railroad switches in the State under penalty for violation thereof. An act similar to one of the clauses placed in the Alabama (*q.v.*) constitution ratified in November, 1901, but more drastic in its terms, provides that if any prisoner shall be taken from the hands of a sheriff or his deputy and shall be lynched, this fact shall be taken as conclusive evidence of the failure of the sheriff to perform his duty and the sheriff's office shall thereby become vacated; but the sheriff may be re-appointed by the governor if the latter is satisfied after a hearing that the sheriff did all in his power to protect his prisoner. Some doubt was expressed as to whether this law would be held constitutional by the courts, and whether it was not contradictory by its own terms. An educational act made it compulsory for all children from seven to fourteen years old to attend school if in sound health, and no excuse for non-attendance was to be taken, and boards of truancy were appointed to enforce this law. An act was passed defining kidnapping and making it punishable by not less than ten years' imprisonment.

State Officers.—Holding office in 1901 and through 1902: Governor, Winfield T. Durbin, Republican, elected for four years, term expires in January, 1905; lieutenant-governor, N. W. Gilbert, secretary of State, Union B. Hunt; treasurer, Leopold Levy; auditor, W. H. Hart; attorney-general, W. L. Taylor; superintendent of education, Frank L. Jones; commissioner of insurance, Cyrus W. Neal. Supreme Court: Chief justice, John V. Hadley; associate justices, James H. Jordan, Alexander Dowling, Leander Monks, and F. E. Baker, terms six years.

Congressional Representatives (57th Congress).—In the House: Republicans, James A. Hemenway, from Boonville; E. S. Holliday, from Brazil; James E. Watson, from Rushville; Jesse Overstreet, from Indianapolis; George W. Cromer, from Muncie; Charles B. Landis, from Delphi; Edgar D. Crumpacher, from Valparaiso; George W. Steele, from Marion; Abraham L. Brick, from South Bend. Democrats, Robert W. Miers, from Bloomington; William T. Zenor, from Corydon; Francis M. Griffith, from Vevay; and James M. Robinson, from Fort Wayne. In the Senate—Charles W. Fairbanks (until 1903), from Indianapolis, and Albert J. Beveridge (until 1905), from Indianapolis—both Republicans.

INDIANA UNIVERSITY, at Bloomington, Ind., founded 1820, maintains no professional school except law. During the year 1900-01, the faculty consisted of 77 professors and instructors, and the student body numbered 1,137, of whom 1,055 were undergraduates and 82 resident graduates. Since 1867 it has been a co-educational institution, the proportion of women students being relatively constant at about 35 per cent. In 1901 the enrollment consisted of 789 men and 348 women. The university is an integral part of the public school system of the State. The public high

schools stand in this system next below the university, the work of the latter beginning when that of the secondary school closes. There are reported 177 high schools throughout the State, from which graduates are entitled to enter the university without examination. The instruction given in the summer school is a part of the university work, and has been such since 1900. The library contains about 35,000 volumes. Tuition is free in the regular and summer sessions, with the single exception of the law school, which charges \$12.50 a term. This does not, however, do away with reasonable charges for the use of the gymnasium, library, and laboratories. The course of study prescribed for graduation follows conservative lines. The course consists of (1) certain prescribed subjects, (2) a major, and (3) enough elective subjects to complete the four years' work. See *UNIVERSITIES AND COLLEGES* (paragraph The Elective System).

INDIANS OF THE UNITED STATES, PRESENT CONDITION OF. *Population.*

—The present Indian population of the United States, exclusive of those in Alaska and of the small bands and scattered individuals not liable to federal supervision, is officially reported in round numbers at 270,000. As this, however, includes all adoptions and officially recognized claimants, even though repudiated by the tribal governments, it may properly be scaled down by from 30,000 to 40,000. Thus the Five Civilized Tribes of the Indian Territory—the Cherokee, Choctaw, Creek, Chickasaw, and Seminole—carry upon their rolls 20,000 negroes, their former slaves and their children, with several thousands of whites adopted through intermarriage, and thousands of other claimants for Indian privileges, whose title is repudiated by the Indians, although allowed by recent government decisions. These repudiated claimants, all practically white, number 7,000 in the Cherokee nation alone. Deducting these spurious Indians and adding such individuals of the scattered bands as may fairly be entitled to the name, the whole Indian population of the United States would probably fall short of 240,000 souls. Among the small bands not officially noted, are the Penobscots in Maine; Narragansetts in Rhode Island; Mohegans in Connecticut; Gayhead Indians on Nantucket; Montauks and Shinnecocks on Long Island; Nanticokes in Delaware; Chickahomnies and Pamunkeys in Virginia; Catawbias in South Carolina; Choctaws in Mississippi; and Miamis in Indiana. Of these, the Penobscots, Catawbias, Choctaws, and Miamis still preserve their native languages to a considerable extent, but of the others hardly anything Indian is left but the name, although nearly all have a certain recognition under State supervision. In eastern North Carolina also a considerable body of problematic mixed-bloods, numbering several thousands, now have special State privileges under the title of Croatan Indians.

Appropriations.—The Indian appropriation for the current fiscal year is \$9,736,186.09; or, in round numbers, nearly ten million dollars. The largest items are for schools, \$3,244,250; payment for lands ceded, \$1,925,000; fulfilling previous treaty stipulations, \$2,229,840; miscellaneous support and gratuities, \$628,000. The appropriation to pay for ceded lands is a direct matter of purchase and sale between the government and the Indians and cannot properly be classed as a regular expense. Of that for fulfilling treaty obligations approximately, \$600,000 are for school purposes in addition to the regular school appropriation. The average cost to American taxpayers is thus nearly thirty dollars a year for each Indian, the Indian himself being untaxed.

Education.—Omitting the payments for lands ceded, it thus appears that nearly one-half the appropriation, or not far from \$4,000,000, is for educational purposes. How much more is annually expended for the same purpose by missions and other private philanthropic establishments is not estimated. From this it will be seen that education is considered the most important factor in the solution of the Indian problem; and yet the commissioner, after enumerating rations, money payments, and indiscriminate leasing of allotments, as three great hindrances in the way of the Indian toward independent self-support, continues: "Further observation and reflection lead to the unwelcome conviction that another obstacle may be added to these already named, and that is education. . . . The present Indian educational system, taken as a whole, is not calculated to produce the results so earnestly claimed for it and so hopefully anticipated when it was begun." He explains his position by some very plain statements in regard to the methods by which the Indian children of savage parents are gathered up from the reservations to be given a fancy training in schools fitted up at lavish expense, with all that could be expected by the wealthy sons and daughters of the most refined homes—all this at a cost to the taxpayer of some \$45,000,000 in the last twenty years for some 20,000 pupils, and a prospective cost of \$70,000,000 more in the next twenty years if continued on the present plan. "The Indian youth finds himself at once, as if by magic, translated from a state of poverty to one of affluence. He is well-fed, and clothed and lodged. Books and all the accessories of learning are given him and teachers provided to instruct him. He is educated in the industrial arts on the other hand, and not only in the rudi-

ments, but in the liberal arts on the other. Beyond 'the three r's' he is instructed in geography, grammar, and history; he is taught drawing, algebra, and geometry, music, and astronomy, and receives lessons in physiology, botany, and entomology. Matrons wait on him while he is well, and physicians and nurses attend him when he is sick. A steam laundry does his washing and the latest modern appliances do his cooking. A library affords him relaxation for his leisure hours, athletic sports and the gymnasium furnish him exercise and recreation, while music entertains him in the evening. He has hot and cold baths, and steam heat and electric light, and all the modern conveniences. All of the necessities of life are given him and many of the luxuries. All of this without money and without price, or the contribution of a single effort of his own or of his people. His wants are all supplied almost for the wish. The child of the wigwam becomes a modern Aladdin, who has only to rub the government lamp to gratify his desires. Here he remains until his education is finished, when he is returned to his home—to the parents whom his education must make it difficult to honor, and left to make his way against the ignorance and bigotry of his tribe. Is it any wonder that he fails? Is it surprising that he lapses into barbarism? Not having earned his education, it is not appreciated; having made no sacrifice to obtain it, it is not valued. It is looked upon as a right and not as a privilege; it is accepted as a favor to the government and not to the recipient, and the almost inevitable tendency is to encourage dependence, foster pride, and create a spirit of arrogance and selfishness." The commissioner's recommendation, which "will meet the hearty indorsement of all familiar with the Indian and the situation, is to abolish entirely this gingerbread education, and to teach the Indian children simple industries and industrial habits at their own homes, with just enough of common-school education to enable them to transact ordinary daily business—in other words, to give them only what they can utilize in earning their own living. "Beyond this in the way of schools it is not necessary to go—beyond this it is a detriment to go. The key to the whole situation is the home. Improvement must begin there. The first and most important object to be attained is the elevation of the domestic life. Until that is accomplished it is futile to talk of higher education."

There are now enrolled in government Indian schools 22,719 children, of whom 4,622 are in reservation day-schools, 10,782 in reservation boarding-schools, and 7,315 in non-reservation boarding-schools. A few more are being educated under special contract at public district schools. Besides these there are upon the various reservations 55 denominational mission schools, with an enrollment of 3,803 pupils. Of these the Catholics had 2,876 in 36 schools; the Presbyterians, 390 in 7 schools; with Episcopalians, Congregationalists, Methodists, Mennonites, and Society for the Propagation of the Gospel following in the order given. Neither the schools of the Six Nations in New York nor those of the Five Civilized Tribes of the Indian Territory are included in these statistics, the former being under State management, while the latter are under tribal control subject to federal supervision. For the New York Indians the State supports 30 reservation schools, with an enrollment of 846 pupils, besides which there are an orphan asylum and a Friends' mission school. Those of the Five Civilized Tribes are treated elsewhere.

Owing to repeated disastrous visitations of smallpox, a stringent regulation requiring compulsory vaccination of both pupils and employees at all government schools was issued early in the year. A strong recommendation is made for compulsory education. A former ruling prohibiting the admission of new pupils at mission schools until after the government schools were filled, has been rescinded, and parents are now again free to send to the school of their choice; but on the other hand the rations and clothing hitherto issued to the children in certain mission schools, as the regular per capita to which they were entitled as members of the tribe, has been cut off, while continued at the government schools. In view of the fact that the mission schools are doing good civilizing work for nearly 4,000 children, upon very slender resources, this seems an unjust discrimination.

Marriage.—The loose marriage system prevalent among the Indians has long been recognized as one of the great stumbling-blocks in the way of their advancement in civilization, the frequent separations and rematings striking at the very root of family life. More than once efforts have been made to apply a remedy, but to little purpose, until the new issues involved in allotment and citizenship rendered it absolutely necessary to have some definite standard for the settlement of questions of pedigree, inheritance, and title. To show the need of action it is sufficient to state that a short investigation instituted in one tribe recently admitted to citizenship made it probable that the majority of men and women over the age of forty years had been thus "married" to from three to five different partners, most of whom were now living with other mates. When the question was further complicated by polygamy, it was made almost impossible to say what constitutes an Indian family. A congressional bill on the subject having failed of action, the Indian Office, in April, 1901, with the approval of the Interior Department, issued instruc-

tions requiring every agent to keep a permanent register of every Indian marriage, with names of the contracting parties and of the person performing the ceremony, and making a regular license a prerequisite in every case, according to the laws of the State or Territory in which the ceremony is performed. Issue of such license is prohibited to any Indian having an undivorced wife or husband still living, and no future polygamous marriages are allowed. Provision is also made for recording various census data as to age, blood, and pedigree.

Liquor.—In spite of laws against the sale of liquor to Indians, demoralization from the liquor habit is steadily on the increase, particularly in the newly opened Oklahoma country, all efforts to deal with it being practically of no avail from the difficulty of procuring testimony even from the Indian himself, who resents the inquiry on the ground that being now an American citizen, he has as good a right to drink whisky as the white man. The commissioner despairs of better conditions "until the Indian shall have conquered his appetite for stimulants or until his white brother acquires a respect for the law." He recommends a small special fund to pay for the work of procuring evidence. In the meantime Anadarko, the new town at the Kiowa agency, has 34 saloons, while Lawton, another town of six months on the same reservation, has 86, or more than one to every hundred of the permanent population. It needs no prophet to predict the result to the Indian.

Allotments.—The abolition of the reservation system by the allotment of land in severalty has now become the accepted policy of the government. During the past year 8,857 allotments were approved, including all the tribes of the Kiowa, Comanche, Apache, and Wichita reservations in Oklahoma, to the number of 3,724 souls. The total number of allotments already made from the inauguration of the policy is now about 65,000. As a step in the proposed gradual withdrawal of government supervision patents have been issued to each individual of the small band of Chippewas and Munsees in Kansas, their surplus lands have been sold, and their remaining tribal fund with interest has been distributed per capita. Negotiations are under way for the cession of the Grande Ronde reservation, Oregon, and a part of the Lower Brulé, South Dakota.

Irrigation—The Pimas.—The subject of irrigation for many of the western reservations has grown to such importance that \$100,000 was appropriated for the purpose last year, as against half that amount the previous year. The work includes the cleaning and protecting of existing springs, digging of ditches and reservoirs, purchase of water rights, and salaries of two superintendents of irrigation, and is being expended chiefly in Montana, Wyoming, Colorado, New Mexico, and Arizona, a large part being done by Indian labor. The case of the 6,000 Pimas, Maricopas, and Papagos of southern Arizona is especially urgent. These Indians have always been agricultural, raising abundant crops by careful irrigation of lands along the Gila since set apart as their reservation, never having committed a hostile act or asked any help from the government. Recently, however, their water supply has been cut off from above by white settlers, so that for two years the Indians have been on the verge of starvation, and must either become homeless wanderers or ration pensioners unless some measure of water relief is devised. It has been proposed to build a reservoir dam upon the Gila, some distance above their reservation, by means of which it would be possible to irrigate enough land not only for their purposes but also for the use of the San Carlos Apaches, thus giving opportunity for the sale and opening to settlement of the surplus reservation lands.

Leases.—Leasing of Indian lands for pasture, farming, or other purposes has become an important feature of the general plan. Before the opening of the reservations many tribes derived a considerable income from the leasing of the surplus pasturage to cattlemen at prices ranging from 5 to 25 cents per acre. Thus the Kiowas and associated tribes, numbering about 2,800 souls, received \$100,000 annually from this source, or nearly \$40 per capita, while the Cherokee Strip was leased for \$150,000 per annum. The opening of the reservations to settlement has cut off much of this revenue by diverting the land to farming purposes, but on the other hand the Indian is now as anxious to lease his farm allotment as he formerly was to lease the surplus pasturage. The average Indian is either unwilling or unable to work his allotment as a white man would, and his first thought in almost every case is to find some white man to lease it for a share of the proceeds. While such a course is liable to defeat the very purpose of allotment, it has been found necessary to sanction it in order to tide the Indians over the transition stage and stop the further retention of large tracts of land in unproductive idleness while so many industrious and deserving settlers are eager for permission to utilize it. In spite of attempts to restrict the lease privilege to Indians incapable of properly caring for their allotments, the loopholes are so many that it is probable that four-fifths of the new allotments are now leased to white farmers, who pay the Indian owner either in money, produce, or improvements placed upon the land. Whatever the seeming present advantage, it is safe to say that a continuance of the system means the continuance of the Indian in idle helplessness.

Rations and Annuities.—In line with his sensible utterance on the school question, the commissioner's recommendation is strongly for the abolition of the whole ration and gratuity system. He declares that such coddling is outside the function of the State, which is briefly "to see that the Indian has the opportunity for self-support and that he is afforded the same protection of his person and property as is given to others. That being done he should be thrown entirely upon his own resources to become a useful member of the community in which he lives, or not, according as he exerts himself or fails to make an effort." Since 1868 over \$240,000,000 have been thus expended on rations and gratuities, chiefly for the plains tribes, including besides schools and the assistance of blacksmiths, carpenters, etc., axes, spades, hoes, plows, seeds, fruit trees, grindstones, stoves, kitchen furniture, wagons, and even houses, with a complete suit or outfit of clothing annually for each individual. The rations and annuities are now discontinued with most of these tribes, and it is hoped will soon be abolished entirely.

The Alabamas and Mission Indians.—More than a century ago some small bands of the Creek Indians of Alabama crossed the Mississippi and finally drifted down into eastern Texas, where they have since resided under the local names of Cushattas, Alabamas, and Muscogees, estimated to number in all less than three hundred souls. As they have no title to their lands they are now in the position of vagrants, and a bill has recently been introduced in Congress to set aside a small reservation for their benefit from some public lands of the government. The most feasible plan would seem to be to provide for their incorporation with their kindred in the Creek Nation. A recent adverse decision of the United States Supreme Court in the case of the Mission Indians of Warner's Ranch in southern California will probably render necessary some special relief measures. It appears that owing to a peculiar technical flaw in one of the old Mexican grants making provision for them, these Indians, formerly attached to the mission of San Luis Rey, have been dispossessed from lands which they have occupied and cultivated for generations, so that they are now homeless and penniless. In the meantime their case has been taken up by some friends in their own State, with what result remains to be seen. For the Indians of Indian Territory, see article INDIAN TERRITORY, and for the last opening of Indian reservations in Oklahoma, see article OKLAHOMA.

Anthropology in America.—Interest in anthropology has been well sustained during the year 1901. Several noteworthy advances have been made, among which may be noted (1) definite steps toward the creation of an American Anthropologic Association, taken at a conference of anthropologists in Chicago on the last day of the year; (2) the revival of the American Ethnological Society of New York under the influence of Dr. Franz Boas and others; (3) the definite establishment of a department of anthropology in the University of California. The Section of Anthropology of the American Association for the Advancement of Science held an important meeting in Denver August 24-31, and a winter meeting was held in Chicago during the week beginning December 29; in connection with the latter the American Folklore Society held its regular annual meeting. The Anthropologic Society of Washington held bi-weekly meetings during the winter months, at which about one hundred communications were presented; and during the year an arrangement was made with the Société d'Anthropologie, Paris, for certain cooperation which it is hoped will lead to a plan for international action among societies devoted to the science of man. The American Ethnological Society also held numerous and profitable meetings during the winter months. The publication of the *American Anthropologist* (F. W. Hodge, of the Smithsonian Institution, managing editor) was continued, largely under the support of the Washington and New York societies; and it is noteworthy that this American journal is now recognized as ranking with, or above, the finest periodicals of its class in the world. The official institutions for anthropologic research have been active. The Bureau of American Ethnology continued operations in both field and office; among the field workers were Dr. J. Walter Fewkes in New Mexico and Chihuahua, Dr. Frank Russell in Arizona and New Mexico, Mr. James Mooney in Oklahoma and Indian Territory, Dr. Albert E. Jenks in the Lake Superior region, Dr. Albert S. Gatschet and Miss Alice C. Fletcher in Indian Territory, Mr. J. N. B. Hewitt in Ontario, Dr. John R. Swanton in British Columbia, and Messrs. William Jones and H. H. St. Clair, 2d, in different sections of western United States. During the year, two reports, each in two large royal octavo volumes, were published; while two volumes of a new series of bulletins were about to leave the press at the end of the year. The United States National Museum (W. H. Holmes, Head Curator of Anthropology) continued the acquisition of objective material representing aboriginal and other peoples, and materially enlarged the display of such material. Professor Holmes made a profitable field trip (see *ARCHÆOLOGY, AMERICAN*), while Dr. Hough spent several months in the field, and several papers relating to anthropology were published in the Report of the Museum, while Professor Holmes completed an important memoir on aboriginal

pottery, and Professor O. T. Mason prepared an extended monograph on aboriginal basketry. The Jesup North Pacific Expedition, under the patronage of Mr. Morris K. Jesup, did excellent work on both shores under the general direction of Professor F. W. Putnam and the immediate supervision of Dr. Franz Boas, of the American Museum of Natural History in New York; several parties were kept in the field, the researches of Dr. Roland B. Dixon in northern California being among those of particular excellence; and a number of important publications were made in the series of royal quarto memoirs as well as in octavo papers. Extensive studies of the aborigines of the Pacific coast were made also under the patronage of Mrs. Phoebe A. Hearst, the work of Dr. A. L. Kroeber and Dr. Philip Mills Jones being especially noteworthy. Ethnologic trips were made by Dr. George A. Dorsey, of Field Columbian Museum, and Dr. Stewart Culin, of the museum connected with the University of Pennsylvania, and creditable publications emanated from both institutions. Among the real contributions to the science may be noted Powell's series of papers on the classification of anthropology, published in the *American Anthropologist*; Boas's linguistic records, especially of the Kwakiutl and Tsimshian tribes; McGee's account of the Seri Indians, viewed from the psycho-social standpoint, and Holmes' and Fewkes' interpretations of the symbolism depicted on aboriginal pottery. Summarily, it may be said that the progress of anthropology during the year was excellent on the descriptive side, and unexcelled on the systematic side.

INDIAN TERRITORY, an unorganized Territory of the United States, set apart by Congress in 1834 for Indian reservations, has an area of 31,000 square miles. The population in 1900 was 391,960, while in June, 1901, as estimated by the government actuary, it was 413,000. This total is made up of Indians, some 16,000 negroes, and 300,000 whites, including men with permits to reside in the Territory, employees of the Indians, railroad men, miners, and others. There are five nations and seven reservations in Indian Territory. The largest town is Ardmore, with 5,681 inhabitants in 1900.

Industries.—Although the census reports of 1900 indicate a large percentage of increase in the manufacturing interests of Indian Territory since 1890, these interests are still insignificant when compared with the industries of older communities. In the last decade the average number of industrial wage-earners increased from 167 to 1,714, or 926.3 per cent. The amount of actual capital invested in 1900 in the 789 manufacturing establishments reporting, exclusive of capital stock, was \$2,624,265, and the gross value of the products, inclusive of materials re-used in the process of manufacture, was \$3,892,181, an increase of 1,463.6 per cent. over the value in 1890. Flour and grist milling is the most important industry, with a product in 1900 valued at \$1,198,472. Next in importance are cotton ginning and the making of cottonseed oil and cake, with combined products valued in 1900 at \$797,407. Numerous smaller manufactures exist, adapted to the needs of a new and rapidly growing country.

Indian Affairs.—Under the operation of the Dawes Commission (organized 1893) and the Curtis act (1898), the autonomous tribal governments in the Indian Territory are rapidly disintegrating. The school systems of the Five Civilized Tribes are under the control of the Interior Department, working through a United States superintendent of schools and four supervisors, in conjunction with representatives of the tribal governments, whose action, however, is subject to approval of the department authority. In the Choctaw and Chickasaw nations this Federal control includes also the control of the coal and asphalt mining royalties, from which these two tribes derive their principal school income. The coal mining leases number 79, with annual royalties aggregating, in round numbers, \$198,000. There are six asphalt mining leases, with royalties amounting to \$1,214. No leases are permitted to the Cherokees so long as they refuse to hold their land in severalty. The general result of government school supervision seems to be in the direction of improvement. The five tribes support 23 boarding schools and about 500 day schools, including some 50 for negro children. There are also a number of denominational, mission, and other private schools. Under a special provision of the Curtis act, incorporated towns in the Indian Territory are authorized to levy a school tax, and about a dozen have made the attempt, but with insufficient funds. "Many new villages are springing up all over the Territory, and under present conditions the lot of the white child is deplorable and pitiable. The white children of this great and growing section are helpless, and justice and humanity demands that some relief be given. There are now about 100 incorporated towns in the Territory, with populations ranging from 150 to 6,000, and over 120 townsite limits have been established by survey. The Dawes Commission, officially known as the Commission to the Five Civilized Tribes, is still at work deciding citizenship claims and completing preparations for final allotment in severalty. Agreements for allotment have now been made with all the five tribes excepting the Cherokees, the latest being that with the Creeks, proclaimed by the President on June 25, 1901. An agreement with the Cherokees was defeated on

April 29 by an overwhelming vote of the tribe, which appointed a committee to negotiate another agreement with the Dawes Commission. This action was disapproved by the President on June 11, and there is now no agreement between the government and the Cherokee Nation relative to the distribution in severalty of the land and other tribal property, and all work looking to that result is being carried on under the provisions of the Curtis act and subsequent acts of Congress. As the white population of the two Territories of Oklahoma and the Indian Territory, numbering already about 800,000, is practically unanimous for a change looking to speedy statehood, the end cannot long be delayed, the real issue being that of single or double statehood.

The Kiowa Opening.—The last great opening of Indian lands was that of the Kiowa, Comanche, and Apache reservation, with the adjoining Wichita reservation, in southwestern Oklahoma, on August 6, 1901. The first of these contained approximately 3,000,000 and the other 750,000 acres. Each Indian had been allotted 160 acres of his own selection, inalienable for a term of years; other reservations were made for Federal, Territorial, and other public purposes, and the balance was then disposed of by lottery for homesteads of 160 acres each, or by public auction for building lots in the regularly established townsites. The combined reservations were laid off into three counties, designated from the principal tribes as Caddo, Kiowa, and Comanche, with county seats established under the names respectively of Anadarko, Hobart, and Lawton. For months before, thousands and tens of thousands of eager settlers had been waiting for the opening of the drawing and the auction, so that within a week of the proclamation thriving towns sprang up on the new sites, and the whole municipal machinery was soon in action, while throughout the surrounding country the fortunate ones were cutting timber, building fences, and making other preparations for life on their new homesteads. The proceeds of the town-lot sales were turned back into the treasuries of the new counties for public purposes, as will also be the proceeds of certain reserved "school lands."

INDO-CHINA, FRENCH, comprises the dependencies of Anam, Cambodia, Cochinchina, and Tonquin, and the district of Laos, all of which are under the control or protection of the French government, and are incorporated into a single colony for administrative purposes. Their combined area is estimated at 363,130 square miles, and the total population at 23,323,499.

The administration is in the hands of a civil governor-general, M. Paul Doumer since 1896, whose official residence is Hanoi (population 150,000), in Tonquin. He is assisted by a lieutenant-governor for Cochinchina and a resident-superior for each of the other divisions; by a permanent council, of which he is a member, which decides upon the budgets for Cochinchina and Laos, and advises regarding those of Anam, Cambodia, and Tonquin. The military force in the colony consists of about 12,000 French troops and a native force of 17,000. The chief sources of revenue are the customs, government monopolies, railways, posts and telegraphs, and the expenditure is chiefly for public works and the support of the military and judicial services. In 1900 the local budget was estimated at 49,917,200 francs, of which France contributed 19,222,000 francs. The French contribution was the same in 1901. (The franc is worth 19.3 cents.)

The chief products of the colony are rice, pepper, raw hides, cacao, cotton, sugar, and spices. The most important export is rice, which was valued at about 98,414,000 francs in 1898. The imports increased from 115,465,880 francs in 1899 to 186,044,390 francs in 1900, an increase of 61 per cent., and the exports, in the same period, from 133,919,000 francs to 151,338,300 francs. Of the imports, France sent 74,220,400 francs and took about 30,000,000 francs of the exports.

There is great activity in railway building in the country. Early in 1901 a syndicate was formed for the construction of a railway into the Yunnan province of China, directly north of the colony. A line from Haiphong, on the coast, to Lao-Kay, on the Yunnan boundary, 239 miles distant, was built by the colonial government in 1900-01 and is now in operation. The syndicate is to continue this line 291 miles into Chinese territory, finding a terminus in the city of Yunnan-Sen. The syndicate has an authorized capital of 101,000,000 francs, of which 12,500,000 is share capital and a similar amount a subvention from the colonial government. The remainder is in debentures guaranteed by the government. The profits will be divided between the contracting company and the government. When completed the line will be of great commercial importance, as it will open up Chinese territory hitherto difficult of access, and will greatly strengthen the commercial and political position of France in southern China. German newspapers profess to see in the construction of this road a plan to connect with the Russian Siberian system.

See ANAM, CAMBODIA, COCHIN-CHINA, LAOS, and TONQUIN; also SIAM.

INDUSTRIAL COMMISSION. The United States Industrial Commission was established by act of Congress, June 18, 1898, to serve for two years. Its term of service was afterward extended until December 15, 1901. It was composed of

five members of the Senate, five members of the House of Representatives, appointed by the presiding officers of those bodies, and nine other persons appointed by the President of the United States. The purposes of the commission were declared to be (1) "to investigate questions pertaining to immigration, to labor, to agriculture, and to business," and (2) "to report to Congress and to suggest such legislation as it may deem best on these subjects." The method of inquiry was suggested by the law as follows: "The commission shall give reasonable time for hearing, if deemed necessary, and if necessary it may appoint a sub-commission or sub-commissions of its own members to make investigations in any part of the United States. . . . It shall have the authority to send for persons and papers and to administer oaths and affirmations." The commission at the outset organized five sub-commissions, each composed of five members, as follows: (1) On agriculture and agricultural labor; (2) on conditions of labor and capital employed in manufacturing and general business; (3) on conditions of labor and capital employed in mining; (4) on transportation; (5) on statistics. The main body of testimony was taken at Washington before the commission as a whole. Some testimony was also taken in other cities by the members of the different sub-commissions. The taking of testimony began early in December, 1898, and continued until June, 1901. The witnesses were selected with great care, and represented those who could speak with authority on the different subjects investigated. Some of the more important witnesses were as follows: On Trusts—Mr. E. H. Gary, president of the Federal Steel Company; Mr. Charles M. Schwab, president of the United States Steel Corporation; Mr. Charles R. Flint, organizer of the United States Rubber Company; Mr. John D. Rockefeller, and Mr. Henry O. Havemeyer. (2) On Transportation—Presidents Cowen, of the Baltimore and Ohio Railroad, Fish, of the Illinois Central, Ripley, of the Atchison, Topeka and Santa Fé, and Stickney, of the Chicago and Great Western; representatives of the Interstate Commerce Commission and of the various brotherhoods and orders of railway employees also gave testimony. (3) On Labor, Manufactures, and General Business—Presidents Gompers, of the American Federation of Labor, Mitchell, of the United Mine Workers, and Shaffer, of the Amalgamated Association of Iron and Steel Workers, testified on labor organizations; Mr. John H. Converse, Mr. Charles J. Harrah, and Mr. Charles H. Cramp, on manufacturing business; and Miss Florence Kelley, Mr. James M. Filbert, chairman of the Board of Arbitration and Mediation of New York, and Hon. Carroll D. Wright on labor problems and conditions. The enormous mass of testimony taken by the commission has been carefully digested and classified by Mr. E. Dana Durand, secretary of the commission from September, 1900. These digests of testimony give the essential statements of each witness on particular subjects, page references to the original testimony being inserted after each statement. There is also presented a review and a summary of opinion on both sides of each question treated. The digest, the review of testimony, and the testimony itself are fully indexed, and numerous cross references are given. The work of Mr. Durand is unique and renders the work of the Industrial Commission of peculiar value.

The commission also enlisted the services of a corps of experts, who supplemented the testimony by special reports upon important topics. The principal of these reports are as follows: (1) Prison Labor, by Mr. William H. Stewart, with an appendix compiled by Mr. Victor H. Olmstead, giving a digest of the convict-labor laws in force in the United States in 1898; (2) Trust and Corporation Laws, by Professor J. W. Jenks; (3) Labor Legislation, by Mr. Frederic J. Stimson; (4) Agricultural Boards; (5) Elevator and Warehouse Laws; (6) Taxation of Transportation Companies, by Mr. R. C. McCrea; (7) Railway Regulation under Foreign and Domestic Laws, by Mr. B. H. Meyer; (8) Taxation of Corporations, by Mr. George Clapperton; (9) Prices of Industrial Securities; (10) Cost and Prices of Iron and Steel Products; (11) Wholesale and Retail Prices of Oil, Salt, Sugar, and Baking Powder; (12) General Statistics of Immigration and Foreign-born Population, by Mr. E. Dana Durand; (13) Economic Factors of Immigration, by Mr. John R. Commons (including a section by Miss Kate H. Claghorn on the foreign immigration in New York City); (14) Asiatic Labor on the Pacific Coast, by Mr. Thomas F. Turner; (15) Condition of Foreign Legislation Upon Matters Affecting General Labor, by Mr. Frederic J. Stimson; (16) Labor Organizations, Labor Disputes, and Arbitration, by Mr. Charles E. Edgerton and Mr. E. Dana Durand; (17) Railway Labor, by Professor Samuel McCune Lindsay; (18) Industrial Combination in Europe, by Professor J. W. Jenks; (19) The Distribution of Farm Products, by Mr. John F. Crowell.

The report of the commission will consist of nineteen octavo volumes—eighteen being devoted to testimony and special reports, and the nineteenth to the body's final report. The titles of the volumes are as follows: I. Preliminary Report on Trusts and Industrial Combination; II. Trusts and Corporation Laws of the

United States and Several States, and Court Decisions; III. Prison Labor; IV. Transportation; V. Labor Legislation, National and State; VI. Distribution of Farm Products; VII. Capital and Labor in Manufacturing and General Business; VIII. Chicago Labor Disputes; IX. Transportation (second volume); X. Agriculture and Agricultural Labor (testimony and digest); XI. Agriculture and Agricultural Labor (appendices and special reports); XII. Conditions of Capital and Labor in the Mining Industries; XIII. Trusts and Industrial Combinations (second volume); XIV. Conditions of Capital and Labor in Manufacturing and General Business (second volume); XV. Immigration and Education (testimony, digests, and special reports); XVI. Foreign Labor Legislation; XVII. Labor Organizations Labor Disputes, and Arbitration, and Railway Labor (two special reports); XVIII. Industrial Combinations in Europe; XIX. Final Report of the Industrial Commission.

See TRUSTS; LABOR AND LABOR LEGISLATION; ARBITRATION, LABOR; and STRIKES AND LOCKOUTS.

INFLUENZA, EPIDEMIC (LA GRIPPE). During the winter of 1900-01 many cases of the gripe were reported. In January, 1901, there were thousands of patients suffering with the disease in all the large cities, and a surprisingly large number of deaths were ascribed to it or to the bronchial pneumonia which follows in a few of the cases. In Manhattan, New York City, there were 100 deaths from gripe in the second week in January, and as many in Brooklyn. Similar reports were received from Buffalo, Pittsburg, Chicago, Rochester, and Washington. The astonishing total of 7,000 cases of the epidemic influenza were reported in Fort Worth, Tex., during this week. Hospitals and clinics were crowded by gripe patients seeking relief until early in March, when the epidemic rapidly subsided.

INGRAM, ARTHUR FOLEY WINNINGTON, former bishop of Stepney and suffragan bishop of London, succeeded the late Right Reverend Mandel Creighton (*q.v.*) as bishop of London in 1901. Bishop Ingram was born in Worcestershire, January 26, 1858, and was educated at Marlborough College and Keble College, Oxford. For three years after graduating at Oxford (1881-84) he was a private tutor, and was then made curate of St. Mary's, Shrewsbury. In 1885 he became private chaplain to the bishop of Lichfield, a post which he held for four years. He became head of the Oxford House, in Bethnal Green, London, a social settlement of the East End, in 1889, and at the same time acted as chaplain to the archbishop of York and to the bishop of St. Albans. In 1895 he was chosen rector of Bethnal Green, and a year later rural dean of Spitalfields, these appointments being followed by that of suffragan bishop of Stepney in 1897. Bishop Ingram is the youngest man who has ever held the See of London, is the first suffragan to be raised to that position, and is distinguished for his enthusiastic devotion to practical church work. As head of the Oxford House he was known all over East London, and his preferment over the older and more scholarly type of churchmen indicates the practical leaning of the Church in London.

INSANITY. Increasing numbers of insane in the United States led to special study of this class during 1901. Asylums in many parts of the country are reported to be overcrowded, notably those of New York City and the metropolitan district, and to a less degree all of the other New York State hospitals for the insane. The United States government asylum, St. Elizabeth's at Washington, D. C., is so overcrowded that measures have been begun to eliminate all patients who do not properly belong there. This asylum is intended for the insane from the army and navy and from the various branches of the government service. Several inmates have been left destitute in this country, coming to Washington from foreign countries or from other States, and are not proper charges upon the government. The matter of the alien insane has attracted the attention of a statistician, who finds that there are confined and supported in the asylums of the United States a number of alien insane far in excess of the proportion which the foreign-born population of the country bears to the native-born. The proportion of native-born to foreign-born in 1890 was 84 to 16. In 1901 the proportion of native-born insane to foreign-born insane was 65 to 35. This excess of foreign-born insane imposes an immense expense upon the taxpayers, for it is estimated that their maintenance costs not less than \$10,000,000 a year. The foreign-born insane cost New York State about \$1,000,000 annually. The danger to the population from absorbing a deteriorated and degenerate foreign stock is apparent. The present law provides that an immigrant may be returned to his native country if he becomes insane within one year. The attention of Congress has been called to the necessity of making the time of probation at least two years, and of conducting a searching examination into the history and antecedents of all immigrants. In December, 1901, a proposition was made to place all the insane of Maryland under State care, all institutions for their accommodation being overcrowded, and the erection of new buildings being necessary.

Epileptics are now confined in the institutions for the insane. The legislature of the State will be asked to take action early in 1902. The legislature of Florida passed a bill at its session of 1901 making four successive years of insanity on the part of husband or wife a sufficient ground for divorce, provided that the party in whose favor the decree is granted guarantees the maintenance of the divorced insane person.

INSECTS AND THE PROPAGATION OF DISEASES. Further study of the method of transmission of yellow fever, in 1901, confirms the views accepted two years ago, that the mosquito is the principal active agent. Dr. Bemiss, of the navy, in 1880 stated his opinion that "the poison of yellow fever is reproduced chiefly, if not wholly, in the body of the patient, but undergoes some change after it escapes from the body, which increases its toxic quality." Dr. Carlos Finlay, of Havana, in 1881 suggested that the mosquito conveyed the organism of yellow fever from patient to non-immune. Many otherwise mysterious epidemics are explained according to this theory, after a study of surroundings and conditions, as well as of the length of life of a brood of mosquitoes. The commission appointed in 1900 by the surgeon-general of the United States Army to investigate yellow fever in Cuba, consisting of Drs. Walter Reed, James Carroll, A. Agramonte, and Jesse W. Lazear, concluded that "the mosquito serves as the intermediate host for the parasite of yellow fever, and it is highly probable that the disease is propagated only through the bite of this insect." Dr. John Guit  ras, a celebrated authority on yellow fever, and formerly an opponent of the mosquito theory, accepted the theory unreservedly in 1901. The variety of mosquito which serves as the intermediary host for the parasite of yellow fever is *Culex fasciatus*, which is identical with *Culex tiniads* of Giles. In Cyprus, during 1901, a woman, stung in her sleep by ants, developed anthrax. Near her cottage was found a dead sheep, from which the insects had transmitted the malignant bacilli of the disease. The transmission by the mosquito of the parasite of malaria is generally accepted, as demonstrated by several investigators, prominent among whom are Ross and Manson, of England. Obtaining the plasmodium from stagnant water, the mosquito introduces it into the blood of man. From an infected man the insect transfers it to others. Man is the great source from which the mosquito obtains the parasite. During 1901 experiments made by Sambon and Low, Celli, Grassi, and the Red Cross of Italy, demonstrated that the use of the mosquito net and the draining of stagnant pools prevented malaria in individuals living in notoriously malarious countries. Covering the surface of stagnant water with a pellicle of crude petroleum sufficed in many instances to kill the larv   of the mosquito, and decrease of malaria followed. A solution of permanganate of potash, 1 to 1,500, was found as effective, though not so cheap as petroleum, in France. In Corsica it was recommended that the government maintain free stations for the distribution of quinine in malarial regions, and also supply the inhabitants with mosquito nets and frames, and use petroleum for the destruction of the insects and their larv  . The railroads of Italy, 1901, proposed to supply wire gauze screens for windows and doors of workmen's houses and stations, as well as head coverings of netting for employees, in malarial districts, to prevent infection by mosquitoes. In South Orange, N. J., a committee of citizens recommended the abandonment of rain barrels, the screening of water tanks, the covering of fluid in cesspools and in puddles with crude petroleum, and the draining of all pools where possible. Many ponds on Staten Island, New York City, were treated with petroleum by Dr. Doty, health officer of the port, who forced the oil into the mud at the bottom of the pools and ponds, allowing it to rise through the water to the surface. In East and Central Africa experiments by C. W. Daniels led him to believe that *Anopheles funestus* (Giles) is the chief agent in distributing malaria in that country, and that man is the only intermediate host of the malarial parasites.

The ant, the flea, and the fly are charged with carrying the plague bacillus to man. The mosquito, the bedbug, the fly, and the itch insect are convicted of transmitting leprosy. The tick propagates Texas fever. Tuberculosis has been carried by bedbugs, which also disseminate relapsing fever and cancer. The bacilli of anthrax have been found in flies, fleas, and earthworms. Typhoid bacilli have been carried by roaches. Thus insects propagate diseases in two ways: (1) As carriers, bringing infection to a wound or to food or drink, on the surface on their bodies, after crawling over an infected spot, or by bringing the infection in the form of bacilli in their intestinal tracts; (2) as intermediary hosts, like the mosquito, bringing to the victim the infection in the fluids of their bodies and inflicting wounds through which the poison is introduced into the body of the victim. See ENTOMOLOGY, FILARIA, MALARIA, PLAGUE, YELLOW FEVER.

INSTITUTE OF FRANCE, established in 1795 and reorganized in 1816, comprises the following academies: Acad  mie Fran  ais (q.v.), with 40 members; Acad  mie des Inscriptions et Belles-Lettres, 40 members; Acad  mie des Sciences, 66 members; Acad  mie des Beaux Arts, 40 members; Acad  mie des Sciences

Morales et Politiques (revived 1832), 40 members. All members are elected for life and receive an annual stipend.

INVERCLYDE, First Baron, Sir JOHN BURNS, British peer and steamship owner, died at Castle Wemyss, County Renfrew, February 12, 1901. He was born in Glasgow in 1829, and was educated at the University there. His father was the founder of the Cunard Line of steamships, and the son succeeded to the control of the company upon his retirement. In 1890, at his father's death, he became a baronet and was raised to the peerage in 1897. Lord Inverclyde was interested in the idea of converting the merchant marine into cruisers in time of war, and was the first to bring the project to the notice of the British government. He was also an enthusiastic amateur yachtsman. He wrote: *A Wild Night* (1874); *Glimpses of Glasgow Low Life* (1874); *The Adaptation of Merchant Steamships for War Purposes* (1887); and *Something About the Cunard Line* (1887).

IOWA, a western State of the United States, has an area of 56,025 square miles. The capital is Des Moines. Iowa was organized as a Territory, July 3, 1838, admitted as a State, March 3, 1845, and readmitted with enlarged boundaries, December 28, 1846. The population in 1900 was 2,231,853, while in June, 1901, as estimated by the government actuary, it was 2,267,000. The populations of the four largest cities in 1900 were: Des Moines, 62,139; Dubuque, 36,297; Davenport, 35,254, and Sioux City, 33,111.

Finances.—At the beginning of the biennial period ended June 30, 1901, there was a balance in the treasury of \$445,002.37. The receipts for the period were \$5,120,059.54, the expenditures \$4,421,173.74, leaving a balance on June 30, 1901, of \$1,143,888.17. Iowa has no public debt. The State tax rate for 1900 was \$0.0027 per \$1.00, while the total value of State property, as returned for taxation, was \$558,462,618.

Industries.—Iowa is primarily an agricultural State, and its industries, which increased much faster than the population from 1850 to 1870, have within the last decade shown little tendency to increase at a fast rate or to become consolidated in good manufacturing centres. Industries in the six largest manufacturing cities—Burlington, Council Bluffs, Davenport, Des Moines, Dubuque, and Sioux City—have increased more slowly than in the smaller towns, and, speaking generally, the manufacturing enterprises are evenly distributed over the State and are diversified in character. In the early period of the State's settlement the principal manufacturing products were lumber, flour, leather, and woollen goods. With the exception of flour, however, the manufacture of these has since declined, while slaughtering and the factory manufacture of butter and cheese have taken their place as the leading industries. Lumber products have especially declined since 1890, owing to the exhaustion, through misuse, of the timber lands. In 1890 the lumber products were valued at \$12,056,302, and in 1900 at \$8,677,058, showing a decline of 28 per cent. On the other hand, the manufacture of planing-mill products has increased since 1890 from \$3,588,856 to \$5,295,546. Wholesale slaughtering and meat packing, although only increasing in value during the decade 9.7 per cent., was still the most important industry of the State, the value of its products for 1900 being \$25,695,044. Allied to this industry is the factory manufacture of butter, cheese, and condensed milk, ranking second in importance and having products in 1900 valued at \$15,846,077. This industry increased during the decade 50.3 per cent. Flour and grist milling, holding third place among the manufacturing interests of the State, increased 16.8 per cent. during the decade, or in almost exact ratio to the increase in population. Its products in 1900 were valued at \$13,823,083. Among the other important industries of Iowa may be mentioned that of car construction and railroad repairs which is really the first industry in the State if the amount paid out in wages (\$3,277,617) is alone considered. The central location of Iowa between the east and west and its own extensive transportation facilities have brought about this result through the building of extensive car construction and repair shops. Printing and publishing products were valued in 1900 at \$6,145,563, an increase of 35 per cent. The products of foundries and machine shops were valued at \$4,460,914; food preparations at \$3,604,031; carriages and wagons at \$3,931,067. An industry peculiar to Iowa is that of making pearl buttons from the shells of the native fresh-water mussel along the Mississippi and other rivers. This industry was first established in 1891, and its products in 1900 were valued at \$266,538. The financial success of the industry is undoubted, but as no attention is paid to the breeding of young mussels, which require from 10 to 18 years to grow to serviceable shells, it is feared that the mussel banks will be soon exhausted. It may be stated that since 1850 the population increased from 192,214 to 2,231,468 in 1900, an increase of 1,060.9 per cent. In the same time the average number of employees increased from 1,707 to 58,553, or an increase of 3,330.2 per cent. This large increase, however, in the ratio of wage-earners was almost entirely before 1880, and since 1890 the number of industrial wage-earners has slightly decreased in proportion to the population.

Excluding capital stock, the amount of capital invested in the manufactures of the State was \$102,733,103, 14,819 establishments reporting, and the gross value of the products for 1900 was \$164,617,877. Deducting from this sum the value of products re-used in the process of manufacture, the true net value of the manufactured products of the State for 1900 is found to be \$120,499,005.

Republican Convention.—The Iowa Republican State Convention met at Cedar Rapids on August 6, and nominated for governor A. B. Cummins, of Des Moines. The platform adopted was, like the Ohio platform (see OHIO, paragraph Republican Convention), largely devoted to delineating the excellences of the national Republican administration. As in the Ohio platform, also, a protest was entered against "all legislation designed to accomplish the disenfranchisement of citizens upon lines of race, color, or station in life," and the action of the Democrats in the South was condemned for this reason. The policy of a protective tariff was indorsed, but with such changes as the progress of American industries made advisable, and reciprocity was advocated as the natural complement of protection necessary to bring about the realization of the highest commercial possibilities. With regard to combinations of capital, the platform asserted the right of the people to enforce such restrictions as would protect the individual and society from the power wielded by corporations. "We favor," the platform stated, "such amendments of the interstate commerce act as will more fully carry out its prohibition of discrimination in rate-making, and any modification of the tariff schedules that may be required to prevent their affording shelter to monopoly."

Democratic Convention.—The State Democratic Convention of Iowa met at Des Moines on August 21 and nominated for governor Thomas J. Phillips, of Ottumwa. The chief interest of the convention centred, as did that of the Ohio convention (see article OHIO, paragraph Democratic Convention), upon the question of reaffirming or repudiating the national Democratic platform adopted at Kansas City, July 5, 1900. There was submitted to the Iowa convention by the resolutions committee a majority and two minority reports. The majority report repudiated, by omission, the Kansas City platform, and confined itself entirely to State issues. One of the minority reports stated that State matters were the predominant issues of the campaign, and the other minority report reaffirmed the Kansas City platform. This last report was adopted by the convention by a vote of 669½ to 550½. The plank on State issues, upon which all of the committee reports were agreed, demanded a reform in the taxation laws, the repeal of the mulct liquor law, and the enactment of a local option license law.

Elections.—The elections in Iowa in November, 1901, were for governor and members of the State legislature, the remainder of the State ticket being elected in even years. The vote for governor was: Albert B. Cummins, Republican, 226,848, and for P. J. Phillips, Democrat, 143,716, giving the Republican nominee a majority of 83,133. It will be seen that this Republican majority was a very large one for an off year, the total plurality for McKinley in 1900 being 98,512; but at that time a total vote of 530,326 was polled, while in 1901 the total vote was only 390,516. So far as this result had a bearing upon national politics, it appeared to show that the Democratic State platform adhering to the national Kansas City platform of 1900 was not pleasing to the electorate. The State legislature elected consisted of 123 Republicans and 27 Democrats.

State Officers.—Elected in November, 1899, to serve from January, 1900 to January, 1902—Leslie M. Shaw, governor; J. C. Milliman, lieutenant-governor, and Richard C. Barrett, superintendent of education—all Republicans. Elected in November, 1900, to serve from January, 1901, to January, 1903—William B. Martin, secretary of state; Frank F. Merriam, auditor; Gilbert S. Gilbertson, treasurer, and Charles W. Mullin, attorney-general. Elected in November, 1901, to serve from January, 1902, to January, 1904—Albert B. Cummins, governor; John Herriott, lieutenant-governor, and Richard C. Barrett, superintendent of education—all Republicans. Chief justice of the Supreme Court, term one year, Josiah Given, Rep., in 1901, and Scott M. Ladd, Rep., in 1902. Associate justices in 1901, Scott M. Ladd, E. McClain, C. M. Waterman, H. E. Deemer, and J. C. Sherwin. In 1902, Josiah Given, whose term had expired, was succeeded as chief justice by Scott M. Ladd, and the vacancy caused by Mr. Scott's promotion was filled by the election of S. M. Weaver—all Republicans.

Congressional Representatives (57th Congress).—In the House: Thomas Hedge, from Burlington; J. N. W. Rumble, from Marengo; David B. Henderson, from Dubuque; Gilbert N. Haugen, from Northwood; Robert G. Cousens, from Tipton; John F. Lacey, from Oskaloosa; John A. T. Hall, from Des Moines; William P. Hepburn, from Clarinda; Walter I. Smith, from Council Bluffs; James P. Conner, from Denison, and Lot Thomas, from Storm Lake—all Republican. In the Senate: William B. Allison (until 1903) from Dubuque, and Jonathan P. Dolliver, from Fort Dodge, appointed by the Governor to fill the vacancy caused by the death of

John H. Gear, until the meeting of the legislature in January, 1902—both Republicans.

IOWA, UNIVERSITY OF. See **PSYCHOLOGY, EXPERIMENTAL.**

IRELAND. See **GREAT BRITAIN.**

IRELAND, CHURCH OF, after a union of seventy-one years with the Church of England, again became an independent body in 1871, according to the terms of the disestablishment act of 1869. It has (1901) an estimated church population of 579,385 and a clergy represented by 13 bishops (including 2 archbishops), 1,200 incumbents, and 360 curates. The general synod, the supreme governing body of the church, which is made up of the bishops, and a representative house of clergy and laity chosen triennially by the 23 diocesan synods, meets every year in Dublin.

IRON AND STEEL. The year 1901 in the iron and steel industry of the United States was memorable in many respects. The production of ore was largely in excess of that for any previous year; the amount of pig iron produced was even greater than the record of 1900; more new blast furnaces and steel works were erected than ever previously; while what must be considered the crowning achievement from the economic standpoint was the formation of a trust or combination representing fully 60 per cent. of the capacity of the steel works of the United States. (See **U. S. STEEL CORPORATION.**) The prosperity affecting the iron and steel industry of the United States has not extended to Europe, where there has been a general decline in the output. In Germany the production of pig iron in 1901 was 8,422,842 tons. In the United Kingdom of Great Britain and Ireland the production of pig iron for 1901 was estimated at 8,000,000 tons, which indicates a decrease from the previous year, when 8,908,570 long tons were produced. Returns from Russia, France, and Belgium also indicate a diminished production; and the inactivity and overproduction of Continental iron masters has caused prices to sink, so that not only was there no opportunity for American exports, but there have even been imports of steel to fill demands which the makers of American iron and steel could not supply at the same figure. According to the statistics of the *Verein Deutscher Eisen und Stahl Industrielle*, the production and consumption of iron and steel throughout the world are increasing most rapidly, and for purposes of comparison some of the tables published in 1901 are here given. The world's production of pig iron and steel, in metric tons (of 2,204.62 pounds each), for 1880 and 1900 was as follows:

PIG IRON.				STEEL.			
Countries.	1880.	1890.	1900.	Countries.	1880.	1895.	1900.
United States.....	3,896,554	9,349,943	14,009,624	United States....	1,287,983	6,312,074	10,689,640
Great Britain.....	7,800,266	8,080,374	9,062,107	Great Britain....	1,341,690	3,365,109	4,904,232
Germany and				Germany.....	624,418	2,830,468	6,645,869
Luxemburg.....	2,729,088	4,658,451	8,520,390	France.....	388,894	714,523	1,660,118
France.....	1,725,293	1,962,196	2,699,494	Belgium.....	132,062	454,619	654,827
Belgium.....	624,302	829,542	1,018,507	Austria-Hungary.....	134,218	330,000	945,200
Austria-Hungary.....	750,134	945,775	1,475,000	Russia.....	295,568	574,112	1,830,260
Russia.....	448,411	926,482	2,925,600	Sweden.....	28,597	197,177	300,536
Sweden.....	382,108	489,887	526,868	Spain.....		65,000	125,000
Spain.....	52,000	148,704	294,118	Italy.....		65,000	104,200
Italy.....	6,000	8,842	12,200				
Canada.....	23,100	25,800	88,867	Total.....	4,233,420	14,898,082	27,895,882
Japan.....	7,000	15,000	64,000				
Other Countries..	40,000	70,000	150,000				
Total.....	18,484,206	27,460,996	40,886,775				

In consumption also the United States in 1900 stood at the head of the nations of the world, as may be seen from the accompanying table, showing the apparent consumption and the consumption per capita, it being understood that by "apparent consumption" is meant the result obtained after adding the imports to the production and then deducting the exports.

Countries.	Apparent consumption in 1,000 metric tons.	Per Capita Consumption in—		Countries.	Apparent consumption in 1,000 metric tons.	Per Capita Consumption in—	
		kilos.	lbs.			kilos.	lbs.
United States.....	13,777	172	378.4	Austria-Hungary...	1,526	33	72.6
Great Britain.....	7,804	190	418.	Russia.....	3,449	26	57.2
Germany and Lux-				Sweden.....	497	99	217.8
emburg.....	9,118	163	358.6	Canada.....	291	42	92.4
France.....	2,734	70	154.	Switzerland.....	140	47	103.4
Belgium.....	1,317	188	415.8				

Taking the iron and steel consumption together, the following statistics have been obtained:

Countries.	Domestic consumption in 1000 metric tons.	Consumption Per Capita in—		Countries.	Domestic consumption in 1000 metric tons.	Consumption Per Capita in—	
		kilos.	lbs.			kilos.	lbs.
United States.....	12,775	159.7	351.3	Austria-Hungary...	1,457	31.0	68.2
Great Britain.....	5,438	132.6	291.7	Sweden.....	294	68.8	152.4
Germany.....	7,377	131.7	289.7	Italy.....	578	18.1	39.8
France.....	2,631	69.3	152.5	Russia.....	3,417	25.9	57.
Belgium.....	665	93.6	205.9				

Production of Iron Ore in the United States.—Interest as usual centred in the Lake Superior district, as here is produced nearly three-quarters of the total output of iron ore of the United States. The production of the various ranges for 1901 and previous years in long tons was as follows:

Range.	1901.	1900.	1899.	1898.	1890.
Mesaba.....	8,991,278	7,809,535	6,626,384	2,781,587	.....
Menominee.....	3,369,933	3,261,221	3,301,062	1,923,798	2,282,237
Marquette.....	3,121,436	3,457,522	3,757,010	2,097,838	2,993,664
Gogebie.....	2,888,924	2,875,295	2,795,856	2,547,976	2,847,810
Vermillion.....	1,785,769	1,655,820	1,771,502	1,077,898	880,014
Michipicoton.....	230,000	62,500	.....	.....	.....

The ore mined in the Lake Superior region is transported on the Great Lakes by specially constructed steamers, and in 1901 for the first time the shipments exceeded 20,000,000 tons. This was handled by a fleet increased during the winter by 40 newly constructed vessels (see SHIP-BUILDING), and 17,014,076 tons were delivered at the various Lake Erie ports from Toledo to Buffalo, the largest shipments going to Cleveland, Ashtabula, and Conneaut. The Lake Erie ports of course supply the great iron and steel works of Pennsylvania and Ohio, but there were besides about 3,640,000 tons shipped to Milwaukee and South Chicago, where the capacity of the steel works is being increased. The rate for ore from Duluth to Ohio ports was 80 cents a ton, a rate somewhat higher than that secured for other articles of lake commerce. As regards the production of iron ore elsewhere in the United States, estimated at about 7,500,000 tons, it is only necessary to say that the larger part comes from Alabama and Tennessee, and is taken care of by local furnaces. The Russellville (Alabama) iron mines, which produce rich brown ore, were developed during the year, and their product is supplied to the furnaces at Birmingham and Sheffield. The coal for Southern iron works is also mined in their vicinity, so that as far as raw materials go they are in an extremely favorable position. Taking the foregoing conditions into consideration, a conservative estimate places the production of iron ore for the year 1901 at 28,150,000 tons, to which must be added the imports of 966,950 tons. In 1900 the total production of iron ore in the United States amounted to 27,553,161 long tons, valued at \$66,590,504. This production was made up of the four important iron ores. Of these the red hematite formed 82.4 per cent. of the output, limonite 11.7 per cent., magnetite 5.6 per cent., and carbonate 0.3 per cent. Minnesota, Michigan, and Alabama are the most important producers of hematite, while the limonite comes chiefly from West Virginia and Virginia. Ohio, Maryland, and New York are the chief sources of the carbonate, and Pennsylvania, New York, and New Jersey of the magnetite. The accompanying table shows the production of iron ore in the United States in 1900 by States, and the value of the output in each State:

STATE.	Production	Total value at mines.	Value per ton.	STATE.	Production	Total value at mines.	Value per ton.
	<i>Long tons.</i>				<i>Long tons.</i>		
Michigan.....	\$9,926,727	\$28,859,650	\$2.91	Mont. Nev., N. Y.,			
Minnesota.....	9,834,399	24,384,393	2.48	Utah, and Wyo..	\$132,277	\$302,480	\$1.53
Alabama.....	2,769,247	2,629,068	.96	Ohio.....	61,016	98,563	1.62
Virginia & W. Va.	921,621	1,486,318	1.62	Kentucky and Ia....	55,057	60,896	11.1
Pennsylvania.....	877,684	1,890,100	2.15	Missouri.....	41,966	62,745	1.62
Wisconsin.....	746,105	2,061,272	2.79	Conn. and Mass.....	31,185	75,702	2.43
Tennessee.....	594,171	669,067	1.13	Maryland.....	26,223	55,735	2.13
New York.....	441,485	1,103,817	2.50	Texas.....	16,861	13,792	.82
Colorado.....	407,084	1,510,831	3.71				
New Jersey.....	344,247	956,711	2.78	Total.....	\$27,553,161	\$66,590,504	\$2.42
Georgia and N. C.	336,186	446,364	1.33				

a—Average.

Pig Iron.—The American Iron and Steel Association gives the production of pig iron in the United States for 1901 at 15,878,354 tons, as compared with 13,789,242 tons in 1900, of which the Pittsburg district produces from 30 to 35 per cent. of the total. The Carnegie Steel Company, which operates 19 blast furnaces, makes about 20 per cent. of the total amount, and there is a growing tendency for the manufacture of pig iron to be concentrated in the neighborhood of Pittsburg. The lack of freight facilities was felt during the year, and many operators complained of the dearth of cars and engines for transporting the ore and coke, as well as the product of the furnaces. This reason has been given as explaining the upward tendency of prices shown toward the end of the year in the table below.

Pig Iron Production in the United States, 1900 and 1901.

	1900.	1901.
Bessemer pig iron.....	9,596,798	7,943,452
Basic pig iron.....	1,448,850	1,072,376
Spiegeleisen and Ferromanganese.....	291,461	265,977
Charcoal pig iron.....	880,147	339,874
Mixed charcoal and coke pig iron.....	23,294	44,608

Steel Rails.—The production of steel rails bears an intimate relation to commercial conditions at large. In 1901 the steel mills were run to their full capacity, and the output was estimated at 2,600,000 tons, or considerably in excess of that of 1900, when a record of 2,385,682 tons was made. In the fall the railroads placed heavy orders, and a repetition of the heavy business of 1901 is expected.

Manufactured Material.—Plates: In contrast to most of the branches of the steel business, the trade in plates was hardly as satisfactory as in previous years, and the reason assigned was the high price set upon the product by its makers. In the latter part of the year there was an improved demand, as vast amounts of this material must be employed in the construction of railway cars and locomotives. Structural materials were produced on a larger scale than ever previously, the amount for the year being estimated at over 600,000 tons. Sheet steel was also in active demand, and though the strike interfered with the operations of certain of the works of the American Sheet Steel Company, yet the production for the year was said to be greater than ever previously, and by certain authorities was believed to be in a position to be overdone, especially as regards the erection of so many new rolling mills.

Range of Iron and Steel Prices in Pittsburg, 1901.

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Bessemer pig iron.....	\$13.25	\$14.75	\$17.00	\$17.00	\$16.25	\$16.00	\$16.00	\$16.00	\$16.00	\$16.25	\$16.75	\$16.75
Basic pig iron.....	12.25	13.75	16.00	16.00	15.25	15.00	15.00	15.00	15.00	15.75	15.75	15.75
Foundry No. 2.....	14.25	14.50	15.25	15.25	14.75	14.50	14.50	14.25	14.25	14.75	15.50	16.25
Gray forge.....	13.25	13.75	14.50	14.50	14.25	14.00	14.00	13.75	13.75	14.00	14.75	15.00
Bessemer steel billets.....	19.75	21.00	24.00	24.00	24.00	24.00	24.00	24.50	26.50	27.50	28.00	28.00
Sheets No. 27.....	2.90	2.90	3.20	3.20	3.20	3.20	3.50	3.70	3.40	3.80	3.10	3.10
Sheets No. 28.....	3.00	3.00	3.30	3.30	3.30	3.30	3.80	3.80	3.50	3.40	3.20	3.20
Tank plates.....	1.40	1.40	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
Steel bars.....	1.25	1.35	1.50	1.50	1.45	1.45	1.45	1.45	1.55	1.50	1.50	1.50
Steel rails.....	26.00	26.00	26.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00
Wire nails.....	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.25	2.05	2.05
Cut nails.....	2.05	2.05	2.00	2.00	2.00	2.00	2.00	2.05	2.05	2.05	2.05	2.05
Ferro-mang.....	62.50	62.50	62.50	58.50	58.50	58.50	58.50	58.50	58.50	58.50	58.50	52.50

Metallurgy.—In the metallurgy of iron there has been an increased use of the basic Bessemer process, and hence a greater consumption of high phosphorous ores. Magnetic separators are also being used very widely, and ores which up to a year or two ago were practically useless, on account of the high percentage of phosphorus which they contained, are now being treated by these separators and find a ready market. The phosphorus which is extracted from them is sold for fertilizing purposes. In addition to the increased use of the basic process may be mentioned also an increase in the capacity of the blast furnaces in operation. Thus in 1881 455 furnaces produced 4,144,254 long tons of pig iron, while in 1900 232 furnaces produced 13,789,242 long tons, this being an annual capacity per furnace of 9,108 long tons and 55,437 long tons respectively. The number of furnaces in blast at the close of 1901 was 266. R. W. Hunt, in a paper before the American Institute of Mining Engineers, contributed some interesting figures regarding the finishing temperatures of steel rails. He found that the heat at which rails of 80 pounds to the

yard were finished under the old conditions in most rail mills averaged 1,795° F. In the Edgar Thompson mill under existing conditions it was found that the temperature of partial rails when first placed on the cooling table averaged 1,762° F. The finished rails on leaving the rolls recorded an average of 1,580° F. In the Joliet McKenna renewing mill it was noted that the average temperature at which the rails were drawn from the reheating furnace was 1,750° F., and as the rails left the finishing rolls their average temperature was 1,480° F. The experiments of Malland and Waldron show that if aluminum is added to cast iron the carbon percentage, which remains unchanged at the beginning, decreases greatly as the amount of aluminum goes above 2 per cent. A new method, known as the Giebelier process of hardening steel, has been described in the *Consular Reports*. It is claimed that by this method all sorts of iron can be given strength and hardness which is double that produced by the Harvey, Krupp, or Boehler processes, but that the cost of production is 50 per cent. less.

Iron and Steel Trade for 1901.—The high prices of 1900 were not reached in 1901, but the returns received were considered ample by most of the workers, and the mills that were not closed by strikes were kept running throughout the year. From the beginning of the year the prices advanced, and the advance was accompanied by an increased demand, which in December was the largest ever experienced in that month. The effect of the United States Steel Company (see UNITED STATES STEEL CORPORATION) is considered by writers for the technical journals to have been for the best interests of the trade, and the benefits have accrued not only to its stockholders but to the independent companies. They point out that the trust has resisted every attempt to put an exorbitant price upon iron and steel products, and has aimed to promote business rather than to restrict the production by too high rates. So keen was the demand for steel during the year that purchasers in many cases would have paid prices 20 or 30 per cent. in excess of those asked. In some instances rates were scaled down, as the profits were considered somewhat greater than necessary. Labor troubles have had but small effect on the trade as a whole during the year, although the strike of the sheet and tin-plate workers (see STRIKES) closed for a time several of the mills of the United States Steel Company. However, the other mills of the corporation were able to supply the demand, while the independent makers who were not parties to the price agreement of the leading mills obtained higher rates by prompt deliveries. Another benefit the Steel Trust has conferred is cheapening the production of steel manufactures by having them made at places most favorably situated for supplies of ore and fuel, as well as for the distribution of the finished product. This example of concentration has been followed by independent manufacturers, and is likely to be a potent influence in keeping down the prices of steel products. One feature of the iron trade that worked satisfactorily during the year was the price agreements adopted for steel rails, plates, and structural material. These were observed during the year and were renewed for 1902.

Machinery.—In the machinery trade, conditions in general have been most satisfactory. A large number of new engine plants were under construction, and new machinery was ordered for the various works of the American Locomotive Company. The rapid increase in the manufacture of pressed-steel cars has required a corresponding equipment for the works turning them out. The large number of new steel works have consumed vast quantities of machinery, while the makers of machine tools in particular have been successful in this work.

Export Trade.—The export business of the United States in iron and steel, both in the unfinished condition and in their manufactured form, showed a decrease in 1901. This is to be explained by the large domestic consumption and the fact that there was all the business at home that could be handled. Furthermore, European prices were so low that there was little incentive to make exports, particularly of unfinished material. There have been some extensive shipments of electrical machinery, aggregating about \$5,700,000, included in which is the equipment of various electric railways in Europe and Australia. The total exports of iron and steel and articles manufactured therefrom in 1901 amounted in value to \$102,539,797, as compared with \$129,633,480 in 1900. See MANUFACTURES.

IRRIGATION. The two notable features of irrigation progress of the United States during 1901 were the efforts made to improve State laws, and the increased use of irrigation in the humid sections of the country. In the movement to secure a better administration of western water resources California takes first place. The California Water and Forest Association, which includes in its membership some of the State's foremost citizens in all ranks of life, has raised and expended over \$18,000 in gathering facts showing the economic conditions and material possibilities of the State at the present time. It is proposed to use this information in framing laws to give additional security to investments in irrigation works and to the rights of water users. A similar organization exists in Utah, and it was largely through its

influence that a number of reforms in irrigation legislation were enacted during 1901. An impulse toward securing more settled conditions was also manifested in Nevada, Arizona, and Idaho. Utah, Idaho, Wyoming, Colorado, and Nebraska now have State engineers, and exercise a considerable public supervision and control over the use of streams in irrigation. Montana has a State commission which looks after the construction of irrigation works, and Arizona has a law providing for public commissions to survey and locate reservoir sites. This movement has extended to Congress. Following the recommendations of the President's message, western representatives are asking that the proceeds from the sales of public lands be devoted to the construction of canals and reservoirs of too great magnitude and cost for private enterprise, and for the enactment of laws which will more clearly define the respective spheres of State and national control in the diversion and use of streams.

The improvement in financial conditions throughout the country has resulted in a revival of canal construction and extension by private capital. The last report of the state engineer of Wyoming shows that there are now in that State 9,418 appropriators of water for irrigation. This is about one in every ten of the State's population. Two important canals, one built by the Shoshone Canal and Irrigation Company, of which W. F. Cody ("Buffalo Bill") is president, and the other built by the Big Horn Basin Development Company, have been completed and the lands under them largely occupied by settlers. These canals were constructed under State supervision in accordance with a State law accepting the trust of one million acres of land given by Congress on condition of its being irrigated. In addition to a large number of private ditches and canals, 77 reservoir filings were also made in Wyoming during 1901. The last report of the state engineer of Colorado showed that ditch building is reviving in that State, 562 ditch filings and 147 reservoir filings having been made during the past two years. There has been a rapid settlement of irrigated lands in Idaho. The construction, under State supervision, of two large canals has been begun. Montana has a law providing for the construction of canals directly by the State, and the disposal of the canals and lands to settlers. The first of these canals has been completed. Throughout the central and northern portions of the arid region there has been a large increase in the acreage cultivated, owing to the excellent prices received for grain and hay used in winter feeding of stock.

In the south and southwestern portion of the arid region development has not been so rapid as in the northern portion, but there has been general prosperity among irrigators, and a considerable extension in the acreage of land cultivated. The needs of storage in that section are of first importance, because many of the streams are torrential in character, carrying the bulk of their water supply in flood periods of brief duration. This, to be available for irrigation, has to be stored and distributed when needed.

The irrigation of rice in Louisiana and Texas has reached a magnitude which makes irrigation in the humid portions of the country a matter of national importance. During the past year more miles of irrigation canals were built in Louisiana than in any arid State, and more money was expended in pumping plants to fill these canals with water than was expended for like purposes in any two arid States. The success of irrigation in this section has been most marked. It has trebled and quadrupled land values and promises to enable this country to export rice. Irrigation on an experimental scale has also been carried on in several States of the Middle West, especially in Wisconsin and Missouri. It is beginning to be employed in the cultivation of high grade tobacco in a number of States along the Atlantic seaboard with, thus far, satisfactory results. While irrigation in the East is as yet in an experimental stage, the indications are that it can be profitably employed throughout the whole country by market gardeners and in intensive agriculture wherever the value of the product makes it important to have insurance against drought.

Irrigation in the insular possessions of the United States is also becoming an important subject. The largest pumps in the world, outside of those used for supplying cities and towns with water for domestic purposes, are being used in the Hawaiian Islands for supplying water in the irrigation of sugar cane. Some of these pumps furnish over twenty million gallons daily, and some of the lifts are in excess of five hundred feet.

The construction of large and costly irrigation works by private capital, thus far, has not proved financially satisfactory owing to inadequate land laws, lack of adequate preliminary organization, and the absence of public control over streams needed to secure the just and effective division of the water supply and to give stability to the rights of water users.

Two branches of the federal government are now engaged in promoting better conditions in both these directions. The United States Department of Agriculture is making a study of the institutions and practices of irrigation in order to determine how much water is required to irrigate an acre of land, the time when it is

needed, the loss from seepage and evaporation in transit through canals and in its application to crops. The different State laws are being studied to show the nature of existing rights to streams and the measures needed for their proper record, establishment, and protection. This investigation is being carried on under the direction of the Office of Experiment Stations, which published during 1901 a number of important bulletins dealing with this subject. The United States Geological Survey is engaged in gauging streams to determine the amount of the available surface water supply, studying the geological strata to determine the location and extent of the underground sources, and making surveys to ascertain the location and cost of reservoirs for storing the floods which are now running to waste. Among the recent publications of these two branches of the government there may be mentioned the following: The Geological Survey—Part IV. *Report of Progress of Stream Measurements; The High Plains and Their Utilization*; and a number of bulletins on the conveyance and storage of water; the Department of Agriculture—Bulletin 100, *Irrigation Investigations in California*; *Report on Irrigation Laws of Canada and Wyoming*; and the annual report for 1900 of the irrigation investigations of the Office of Experiment Stations.

See AGRICULTURE; ARIZONA; INDIANS; and for the East Cañon Creek Dam, DAMS.

IRWIN, JOHN, rear-admiral, U. S. N. (retired), died in Washington, D. C., July 28, 1901. He was born in Pennsylvania, April 15, 1832, and was appointed to the navy in 1847. During the Civil War he served on the frigate *Wabash*, and participated in the capture of the forts at Hatteras Inlet and of Forts Walker and Beauregard. He was also in the battle of Port Royal, and was present at the capture of Fort Pulaski in 1862. His promotions came in the following order: Master, 1855; lieutenant-commander, 1862; commander, 1866; captain, 1875; commodore, 1886; and rear-admiral, 1891. In April, 1894, he was retired from the service.

ISTHMIAN CANAL. See NICARAGUA CANAL.

ITALIAN LITERATURE. *History.*—Although Italy can boast of many able and earnest workers in history, their productions for 1901 include few volumes that deserve special mention. A notable exception is afforded by an important study of the history of the Papacy by the Marchese Francesco Nobili-Vitelleschi, almost equally well known as historian, patriot, and statesman, and probably the most cultured representative that Roman aristocracy has to-day in the Italian Liberal party. In his new work, *Della Storia Civile e Politica del Papato*, the first volume of which has lately appeared, the author's purpose has been to avoid as far as possible all questions of religion, and keeping clear of the history of the Church, to treat the Papacy in its civil and political aspect. For this purpose he has divided his subject into periods of approximately four centuries each, corresponding to the principal crises through which the Papacy has passed, the opening volume covering the years from the origin of Christianity to its proclamation as the religion of the empire. Another important volume falling within the same period and having an indirect bearing upon religious history is an exhaustive study of *Julian the Apostate*, which has attracted considerable attention. The author is Gaetano Negri, who has long been prominent in the literary and political circles of Milan, and whose numerous published volumes include several valuable historical works and a critical monograph upon George Eliot. Arturo Segré is a writer best known hitherto as author of a history of Piedmont, covering the years 1366 to 1553. His new volume, *Emanuele Filiberto e la Repubblica di Venezia, 1545-80*, forms in a certain sense a continuation of his earlier work, and although the period covered is not marked by great events, his researches in the archives of Turin and Venice have shed some interesting light upon the diplomatic relations between the two states. Municipal history, in the form of special monographs, flourishes as usual, but there is one, *Cremona nel Quarantotto*, by Alfonso Mandelli, which has a rather special interest as a contribution to the history of 1848. Those who have hitherto written of the momentous events of that year have had much to say of the siege of Rome and the defense of Venice; but the tumultuous scenes enacted in the smaller towns and cities have not yet found a chronicler. Mandelli has done for Cremona what it is to be hoped will be done for many another Italian town. The reprint of Muratori's monumental work, *Rerum Italicarum Scriptores*, begun in 1900 under the editorship of G. Carducci and Vittorio Fiorini, is progressing steadily, and in this connection it is interesting to note that the great mass of Muratori's correspondence, much of it still unpublished, has been at last arranged in chronological order and published under the title *Epistolario di L. A. Muratori*. The first volume has already appeared, and contains an important preface of a biographical and bibliographical nature by the editor, Mateo Campori. The collection should prove a storehouse of interesting information, since Muratori's correspondents included many of the leading minds of his day in history and archæology, in politics and religion, and in science. Another series in course of publication is a collection of studies and docu-

ments relating to *The Sack of Rome in 1527*. The initial volume contains, in upward of 500 pages, the *Recollections of Marcello Alberini*.

Biography, Memoirs, and Letters.—The memoirs and correspondence left by those who take an active part in national events necessarily stand upon the borderline between history and biography. Such a volume is *Diplomatic Episodes of the Italian Risorgimento from 1836 to 1863*, being extracts from the letters of General Giacomo Durando, who, from his appointment as minister plenipotentiary to Constantinople until his retirement to private life seven years later, had an active share in the events of these years, both as soldier and as statesman. The volume includes some interesting correspondence with Garibaldi and Mazzini. Other volumes of letters deserving notice are *Letters of Carlo Denina to his Brother Marco Silvestro*, edited by Professor A. Tallone. They cover Denina's first years in Berlin, and shed light upon many persons and incidents mentioned in his *Lettere Brandeburghesi, Prusse Littéraire*, etc. Full of interest also is the *Correspondence of Alessandro Manzoni and Antonio Rosmini*, annotated by Giulio Bonola. The close friendship between Manzoni and Rosmini is well known, and even aside from this the letters are enjoyable because they mirror back so closely the political and literary life of Italy from 1830 onward. A curious chapter in the sentimental history of two poets is contained in *The Letters of Silvio Pellico to the "Donna Gentile,"* the latter of course being Quirina Maggiotti, whose lifelong devotion to Ugo Foscolo is famous. These letters throw new light upon the intimate life of Pellico, his loyal friendship for Foscolo, and above all his deep admiration for the "donna gentile," whom he exalts as the "glory of her sex." The year 1901 also witnessed the most voluminous and exhaustive biography of Pellico yet written—*Della Vita e delle Opere di Silvio Pellico*, in three volumes. The chief criticism which can be passed upon the author, Ilario Ranieri, is that his strong religious bias has made him at times unjust towards Pellico and other distinguished authors and patriots of that time. Several notable series have this year been brought to a close, among them the *Political Writings and Correspondence of Carlo Cattaneo*, and the *Pensieri* of Leopardi. Of the many critics who have made a special study of the poet of Recanati, few can claim the intimate knowledge possessed by Giovanni Mestica, professor at the University of Palermo. It was to be hoped that Professor Mestica would eventually embody the results of his studies in a comprehensive and systematic monograph upon Leopardi; but he has done the next best thing in revising and collecting his many scattered papers into a single volume, *Studi Leopardiani*. In one part of the volume or another the poet's whole life is to be found—his hopes and fears, the women he loved, and the works he wrote. Unfortunately, it lacks an index. Another critic, Giuseppe Chiarini, who has contributed at least one volume to Leopardi, this year devotes a volume of *Impressions and Memories* to a living poet, Giosue Carducci.

Monographs on the older Italian writers are always in abundance. Among recent contributions to Dante literature should be mentioned a collection of critical essays, *Studi sulla Divina Commedia*, by the well-known specialist, Francesco d'Ovidio, and a very curious and suggestive study by G. Arajs of *The Juridical Institutions of the Middle Ages in the Divine Comedy*. The work is both a study of law and letters, for the author begins with a comprehensive examination of the mediæval legal system, and then proceeds to find out how much of it is reflected in Dante's poem, and thus throws light on a number of obscure passages. In this connection should be noted the death, in the summer of 1901, of one of the most indefatigable of Dante specialists, Professor Scartazzini (*q.v.*), author of the recently completed *Enciclopedia Dantesca*. The notorious and dissolute Pietro Aretino has been made the subject of an exhaustive study by Carlo Bertani, who in the course of a voluminous work containing upward of 1,200 foot notes, reaches a number of conclusions considerably at variance with the accepted traditions. Still another monograph which has attracted favorable notice is a study by the young poet, Alfredo Baccelli, of Giordano Bruno's well-known comedy, *Il Candelaio*. Some critics have pronounced it superior to the much-praised study of the same comedy written by another poet, Arturo Graf.

The editor of the *Illustrazione Italiana*, Rafiello Barbiera, is the author of a new volume of a rather curious sort, *Immortali a Dimenticati* (The Immortals and the Forgotten), containing a heterogeneous collection of new and interesting facts about a host of men once famous. *Scritti Letterari* is a collection of literary estimates by Annibale Gabrielli, reprinted from the columns of the *Fanfulla della Domenica*, of which he is literary critic. The subjects range from Cola di Rienzo to Renan and Ibsen. *Nelle Letterature Straniere*, a volume of essays by Andrea Laforte Randi, bears the subtitle "*Pessimisti*," and discusses among others Swift, La Rochefoucauld, and Schopenhauer. Other volumes worthy of mention are *Garibaldi in Italian Literature*, by G. Stravelli; *Florentine Lectures*, by Isidoro del Lungo; and *From Ronsard to Rostand*, by Guido Menasci.

Fiction.—The year 1901 was not an auspicious one among Italian novelists. Of the small number of writers of the first rank, d'Annunzio is at present devoting his best energies to poetry and the drama, in both of which he has won notable triumphs; Verga, also, prefers to write for the stage, and his long-promised *Duchessa di Leyra* is still awaited; Emilio di Marchi could do no better than reissue in new form his *Demetrio Pianelli*, which made a decided hit some years ago; and De Roberto gives us only a small volume of short stories. The few novels which, rightly or wrongly, have attracted special attention during the year are Matilde Serao's (*q.v.*) *Suor Giovanna della Croce*; Fogazzaro's *Piccolo Mondo Moderno*; and *Il Riscatto*, by Arturo Graf. The first of these is a masterpiece. It depicts the misery, both physical and mental, wrought by the government confiscation of church property; the enforced closing of a convent; and the consequent turning adrift of the shrinking, frightened, helpless nuns in a city whose pitfalls their cloistered life had ill-fitted them to shun. Signora Serao has often showed herself an adept at picturing the mental anguish of sensitive women who find the burden of life too heavy for their frail strength, but nowhere has she painted it more poignantly than in the character of *Sister Giovanna of the Cross*. *Piccolo Mondo Moderno*, on the contrary, was generally acknowledged to be a disappointment, and hardly worthy of the author of *Piccolo Mondo Antico*. The characters were criticised as not well drawn, and the daringly realistic tendency of the whole book was felt to be as unsuccessful as it was unexpected from this avowed disciple of Manzoni. The interest in *Il Riscatto* was in the first instance largely that of curiosity. Arturo Graf's reputation both as a poet and critic is so firmly established that it was interesting to see what he could do in this, his first venture in fiction. As might have been foreseen, it is a work of high literary quality, rich in poetic sentiment. The scene of the story is laid partly on the Riviera and among the Italian lakes; the form is autobiographic, a curious and subtle analytic study of a young man who, like the author, looks upon the world with the sensitive and observant gaze of a poet, a man who by nature and education is prepared to extract all that is highest and best from the complex civilization of to-day, and who nevertheless rests under a shadow, the mystery of a painful family secret. And with true artistic instinct the author guards this secret to the end. In point of literary style, artistic proportion, and sustained interest in the story, *Il Riscatto* deserves to be ranked as one of the literary events of the year. Capuana, a friend of Verga, published a novel and two volumes of short stories. The former, *Il Marchese di Roccaverdina*, may be best defined as a study of remorse. An innocent nian has suffered the penalty for murder, and a haunting horror drives the true culprit to madness. The story is also noteworthy as a picture of Sicilian social life. *Il Decameroncino*, the "Little Decameron," and *Il Benefattore* are the titles of Capuana's other new volumes. The first title is in a measure self-explanatory, although the stories contained in it are not of the stereotyped form of *contes drolatiques* that one might be led to expect, in which the faithless wife, the wily priest, and the over-credulous husband play leading parts. On the contrary, they offer problems which are only too common in real life, and are worked out with all the subtleness that has made Capuana a recognized leader in the Italian realistic school. They are supposed to be related in the first person by one of the characters, a certain Dr. Maggioli, who also serves as narrator in a good share of the stories contained in *Il Benefattore*. Another writer with a talent for painting island life and customs is the Sardinian novelist, Grazia Deledda, whose latest volumes are *Elias Portulu* and *La Regina delle Tenebre*. A book which has attracted rather more attention than even its decided merit would justify is the work of an Englishman who hides his identity under the thoroughly Italian name of Gian della Quercia. It is written in the form of a trilogy, *Risveglio*, *Meriggio*, *Vespere* (Daybreak, Noontide, Twilight), and is intended to be a psychological study of a man's love in early youth, in the prime of manhood, and in approaching age. It has been especially praised for the thoroughly Italian quality of its form and language. Other novels which deserve to be included in this list are: *Macchia d'Oro*, by Bruno Sperani, best remembered for her much-praised *Numeri e Sogni*; *La Maestra Bella*, a study of Apulian village life, by G. Ferri, for many years editor of the *Fanfulla* of Rome; *Il Crepuscolo*, by Emilio Ventura, in which a man, doomed to die from a lingering disease, seeks to save the woman he loves from the torture of his lingering death by allowing her to believe him false to her; *L'Oasi*, by A. Avancini, and *L'Apostolo*, by Remigio Zena, both followers of Fogazzaro; *Il Capolavoro* (The Masterpiece), a work of pronouncedly decadent tendency, dealing with a man described as "the pride of Satan" and a woman whom he spends his life in rendering the masterpiece of corruption; and lastly *L'Olttraggiata*, by G. Marcotti, which attracted notice chiefly on account of its political bearing. It was in essence a bold plea for Italian ownership of the Austrian possessions on the Adriatic coast, and not unnaturally brought the author under the ban of the Austrian government at Trieste.

ITALY, a kingdom of southern Europe, embraces the Apennine peninsula and the islands of Sardinia and Sicily. The area, according to the latest surveys, is 110,674 square miles.

Population.—The census taken on February 9, 1901, showed the population to be 32,449,754, an increase since 1881 of 3,990,126, or a little over 14 per cent., the average increase per annum being .734. If to the absolute growth be added the number of permanent emigrants, who during the last decade have averaged more than 130,000 per year, the ratio of actual increase would be nearly 25 per cent., the largest by far in Europe. The highest gains were made in the Roman provinces, which showed an increase of 33 per cent; Leguria and Sicily came next with 20 per cent., and Lombardy with 16 per cent. The smallest ratio of increase was shown in Venetia, with 11 per cent., and in Piedmont, with 8 per cent. The changes of population in the chief cities were as follows: Naples rose from 494,314 in 1881 to 563,731 in 1901; Rome, from 330,467 to 463,000; Milan, from 321,839 to 491,460; Turin, from 252,532 to 335,639; Palermo, from 244,991 to 310,352; Genoa, from 179,515 to 234,800; Florence from 169,001 to 204,950. Other cities above the hundred thousand mark in 1901 were: Bologna, Venice, Messina, and Catania. It will be noticed that whereas the ratio of increase for the country equaled 14 per cent., the rate of increase in the seven cities enumerated exceeded 34 per cent., indicating a tremendous migration from the country to the city. Especially great were the accessions to population in the cities of the north, Milan showing a gain of 53 per cent., Genoa 37 per cent., Turin 33 per cent., and Florence 20 per cent; and though in the matter of increase Rome surpassed all Italian cities with a rate of 54 per cent., its growth is less significant than the growth of the northern towns in that it might be ascribed to Rome's prestige as the capital of a newly united kingdom, and not, as in the cities of Lombardy, to a rapid industrial development. Roman Catholicism is the dominant religion, there being only about 65,000 Protestants and 40,000 Jews. Education, provided partly by the general government and partly by the communes, is in a low state, though considerable progress has been made of late. The percentage of illiteracy is over 50. The schools in the less populous places are ill-equipped and the teachers miserably underpaid. The attendance at the public schools in 1900 was a little over 2,500,000, with nearly 250,000 children in private institutions. In 1899 the expenses for elementary instruction by state, province, and commune were 63,027,172 lire. Secondary instruction is provided by the *ginnasi* and *licei* in the liberal arts, in the classics by normal institutions and by technical schools. Recent statistics are not available, but in 1896-97 there were 17,689 students in the *licei*, 59,578 in the *ginnasi*, 24,152 in the normal schools, and 47,579 in the technical schools. In 1901 the attendance at the leading universities was: Turin, 2,805; Rome, 2,348; Bologna, 1,590; Padua, 1,569; Palermo, 1,395; Genoa, 1,278; and Pisa, 1,103. Justice is administered in the first instance by pretori in misdemeanors and petty offenses, and by penal tribunals in minor crimes. For serious crimes there are jury courts of assize. Appeals lie from the *pretori* to the penal tribunals, and from the latter, and the courts of assize as well, to the courts of appeal, and ultimately to the court of cassation.

Government and Defense.—Italy is a limited monarchy under the old Sardinian constitution of 1848, modified repeatedly before 1871. The parliament consists of a senate of 338 members, appointed by the crown, and a chamber of deputies composed of 508 representatives, elected for five years by what is practically universal suffrage. The executive power is vested in the king and a council of ministers, who are responsible to the chamber of deputies. Military service is obligatory on all citizens between the ages of twenty and thirty-nine. The terms of service vary from two to five years with the colors and from fourteen to seventeen years on unlimited leave and in the militia. In June, 1899, the total forces numbered 36,009 officers and 3,236,131 men. In March, 1901, the Italian navy consisted of 2 battleships of the first class with 2 building, 3 battleships of the second class, 4 battleships of the third class, 5 antiquated battleships used only for coast defense, 8 armored cruisers with 1 building, 14 protected cruisers, 17 torpedo vessels, 9 destroyers, 183 torpedo boats of various classes, and 1 submarine torpedo boat.

Finance.—Revenue is derived from direct and indirect taxation, state enterprises, and state monopolies (tobacco and salt). The interest on the public debt consumes 40 per cent. of the total revenue, defense 23 per cent., education 2 3-5 per cent., and public works 2 per cent. For the year ending June, 1901, the total revenue was estimated at 1,726,421,692 lire and the expenditure 1,730,312,542 lire. Since 1898 there has been a decided improvement in the relations between national income and disbursements. In 1899 the budget balanced for the first time; in 1900 an estimated deficit of 22,000,000 lire was turned into a surplus of 5,000,000 by an increase of 32,000,000 lire in the revenue. The estimates for 1901 as mentioned showed a provisional deficit of 4,000,000 lire, which, added to the special cost of the Chinese expedition, was expected to amount to eighteen or nineteen millions; but as a fact

the budget for 1901 was closed with a surplus of 45,000,000 lire. The proposed budget for 1901-02 showed a surplus of 13,000,000 lire, in spite of a provision of 32,000,000 lire for extraordinary expenses. Nevertheless, extensive reforms must still be brought about in the system of taxation and in the administration of the revenue. The burden of taxation is, on the whole, so badly adjusted as to weigh most heavily on the poorer classes. The reduction of the foreign duties on grains, and of the domestic *octroi* duties on provisions of every kind, has been demanded by public opinion for a long time. On July 1, 1899, the consolidated debt amounted to 12,256,198,652 lire.

Production and Industry.—More than three-fifths of the laboring population are engaged in agricultural pursuits. The principal products are wheat, maize, oats, barley, rice, hemp and flax, olive oil, and silk. In 1900 the wheat crop was estimated at 40,290,000 hectolitres (hectolitre = 2.838 bushels), a decided decline from the yield of 48,600,000 hectolitres in 1899. The output in wine, on the other hand, increased somewhat, the total production being 32,500,000 hectolitres as against 31,800,000 hectolitres (hectolitre = 26.417 gallons). Sugar production increased from 3,530 tons in 1895-96 to 55,000 tons in 1901. The average production of silk cocoons is estimated at 50,000,000 kilograms (kg = 2.2046 pounds), and the output of silk fabrics at 4,465,000 kilograms. The general condition of the agricultural population in Italy is degraded. In the south the evils of overcrowding are sharply felt, and in spite of emigration the number of inhabitants is still considerably greater than the country can support. In Lombardy especially, the status of the agricultural laborer has of late years been influenced for the worse by the introduction of machinery and the concentration of the land in the hands of large landowners. The workingmen have endeavored to improve their positions by organizing themselves into unions for the purpose of maintaining the price of labor. Frequent strikes have occurred throughout Lombardy, and on a minor scale the history of the anti-machinery agitation in England during the last part of the eighteenth century has been repeated in Italy.

The chief mineral products are sulphur, iron, copper, zinc, and lead. The total value of ore mined in 1898 was, in rough numbers, 72,000,000 lire, of which 40,000,000 lire represented the value of the sulphur output. The annual output of marble, coming chiefly from the quarries at Carrara, is valued at 15,000,000 lire. Manufactures are rapidly developing in the northern provinces of the country, as is evidenced by the extraordinary growth in the population of such industrial centres as Milan and Turin. In large measure the development is ascribed to the influence of protective tariffs and the spread of commercial and technical education.

Commerce, Navigation, and Railroads.—The chief imports of Italy, in the order of their importance, are: Coal, raw cotton, silk, wheat, machinery, wool, timber, hides and animals. The leading exports are silk, wine, olive oil, sulphur, dairy products, hemp, and flax. The value of the silk constitutes in some years over one-half the value of the total exports. In 1899 the value of the imports were 1,506,561,188 lire and of the exports 1,437,416,398 lire. For 1900 the estimates, to be taken with considerable allowance, were: Imports 1,699,235,500 lire and exports 1,338,346,260 lire. The leading countries in respect to Italian trade are, in the order of their importance: Great Britain, Germany, France, Austria, Russia, Switzerland, the United States, and Canada. In view of the approaching termination of the commercial treaties with different European powers, a permanent commission was established in September, 1900, to prepare drafts of new treaties based upon the investigation of official documents of the reports from the chamber of commerce. In 1899 the merchant marine comprised 258 large steamers with a net tonnage of 278,397, and 557 large sailing vessels with a net tonnage of 492,138. Late in 1901 a new ship-subsidy law was enacted, superseding the law of 1893 and favoring in general the construction of steamships over sailing vessels. In 1898 the length of the principal railway lines was 9,747 miles, of which the greater part belonged to the state, but was conceded to private companies for a term of 60 years from 1885, the government retaining the direct control of only a small part of the national system.

HISTORY.

Cabinet Crisis.—Towards the end of 1900 it had become apparent that the Saracco cabinet would not long remain in power. The elaborate system of tax reform which it had announced upon entering into office had not been carried out to any appreciable extent, and even the members of the ministry were divided upon the pressing question of the reduction of taxes. The dissolution of the cabinet was presaged in a way by the resignation of Rubini from the ministry of the treasury on January 11, 1901. Early in February a crisis was precipitated by the action of the ministry in regard to the chamber of commerce of Genoa, which, on account of certain insubordinate action, had been dissolved unconstitutionally by the premier and then reestablished in obedience to the spirit of protest which the course of the

ministry had aroused all over the country. The opposition in parliament seized upon this display of weakness on the part of the cabinet as an opportunity for attacking it in the popular chamber, and on February 6, after a three-days' debate, the Saracco ministry was defeated by a vote of 318 to 101.

The New Ministry.—The task of constructing a new cabinet was intrusted by the king to Signor Zanardelli (*q.v.*), one of the leaders of the Left, who at first attempted to select his associates entirely from among the members of the radical parties, but failing in this, was forced to draw upon the various factions; so that his ministry is in general a composite body, with a slight leaning towards liberalism. As a whole the ministry has been characterized as one of party representatives rather than of great statesmen. As finally constituted, the personnel of the cabinet was as follows: Premier, Zanardelli; interior, Giolotti; foreign affairs, Prinetti; justice, Cocco-Ortu; finance, Vollemborg; treasury, di Broglio; war, Ponza di San Martino; navy, Morin; instruction, Nasi; public works, Giusso; agriculture, Picardi; posts and telegraphs, Calimberti. The most prominent members of the cabinet are Giolotti, of the interior, one of the ablest men in the chamber, and credited with the ambition of supplanting Zanardelli as the head of the government, and Prinetti, whose office was destined to become important on account of the termination of the Triple Alliance in 1903 and the consequent necessity of redefining the position of Italy among the powers of Europe.

The programme outlined by Zanardelli upon entering into office included many reforms in the administration of justice and civil affairs, and above all the reduction of the taxes upon articles of consumption. The chamber, however, was not friendly to the new ministry, because, as was evidenced later in the year, a majority of the members of the lower house were not in favor of fiscal reform. It was only upon the Socialists that Zanardelli could rely for constant support. In greater detail, what Zanardelli purposed to effect during his course of office was as follows: He aimed at the reduction of the national duties on flour and bread in all open communes—in those places, that is, which did not impose any *octroi* duties upon produce brought within the local boundaries—and at bringing as many as possible of the closed communities into the category of open municipalities. He estimated that the change would involve a decrease of 47,000,000 lire in the local revenue, but declared that the loss to the local interests might be made up by a state subsidy of 20,000,000 lire a year and the imposition of local taxes which should not fall upon the poorer classes of the community. He also contemplated a reduction in the price of salt. To meet the burdens which would be imposed upon the state by the proposed measures, it was planned to institute a progressive inheritance tax, as well as a tax upon manufactures in gold and silver and stock speculation, the general tendency being to transfer the burden of taxes from the poorer classes to the richer. On May 17 Zanardelli further announced that the ministry would endeavor to establish central bureaus of labor in the provinces, with a supreme council of labor for the entire country; also that provincial unions would be organized with provincial councils at their head, and that disputes between employers and workmen in agricultural industries would be placed under the jurisdiction of arbitration tribunals established by the state, recourse to which should be obligatory.

The Socialists in the chamber, too restive to wait for ministerial initiative, proposed on March 22 that the import duty on grain should be abolished. The motion was rejected by a vote of 299 to 78. This action on the part of the representatives, coming especially as it did at a time when the price of bread was exceedingly high and there was great want among the poorer population, showed the temper of the chamber in regard to the whole question of fiscal reform as connected with the condition of the laboring classes. A more moderate measure was that introduced by Vollemborg, the minister of finance. This provided for the reduction of the import duty on provisions from 12 lire 30 c. to 10 lire 30 c. But this proposal likewise failed, its failure demonstrating that the new ministry would prove as powerless in its attempt at reform as the one that had preceded it. In fact, in the latter part of July Vollemborg resigned, because he found it impossible to carry out any of the pledges with which he had come into office. He was succeeded on August 11 by Signor Carcano. The week before that Picardi, minister of agriculture, had been superseded by Guido Baccelli. The resignation of the two ministers who were mostly concerned with the execution of the programme in regard to tax reform which the cabinet had set before itself, indicated how helpless practically the ministry was in the face of a hostile chamber.

Agricultural Troubles.—Economic conditions in Italy during 1901 were rather anomalous in the fact that the state enjoyed an unprecedented degree of prosperity and the budget showed a surplus of nearly 30,000,000 lire for the year at the same time that famine conditions were prevailing in parts of the country and disorders arising from conflict between labor and capital were constantly breaking out in the northern part of the peninsula. Especially great was the unrest among the agri-

cultural population of Lombardy. This showed itself in numerous riots and in attacks upon the storehouses and the homes of employers, resulting in frequent collisions with the police. During the month of June there were agrarian strikes in progress near Bologna, Ferrara, and in the neighborhood of Milan. In many places the struggle resulted in bloodshed, which served to embitter the feelings of the laboring classes throughout the northern part of Italy. Speaking in the chamber on June 21 on the subject of the agrarian troubles, Signor Giolitti declared that the condition of the agricultural laborers in many places, though capable of improvement, still showed a remarkable advance from their former deplorable condition. He denied the charge that the ministers had sided against the labor unions and had sought in every way to defeat labor strikes; he justified the conduct of the government by the necessity of preserving law and order, protecting property, and maintaining the right of free exchange in the labor market. That the government as a rule, he said, was not opposed to strikes was shown by figures which proved that during the first six months of 1901 511 strikes had occurred, involving more than 600,000 laborers, and had resulted in a gain of 48,000,000 lire per year in wages, and that in the vast majority of these contests peaceful conditions had been preserved and the government had entirely abstained from interference.

The Socialists.—The spirit of dissatisfaction prevalent among the lower classes, nursed by the unyielding attitude of the chamber in respect to their demands for relief, accounts in a great measure for the rapid growth of the Socialist party in Italy. Both constitutional parties have shown themselves actuated entirely by selfish motives or by class interest, and the lower classes have been led to believe, and reasonably, too, that it is only to the Socialists that they can look for relief. With the development of the towns in northern Italy, and the rapid increase of the industrial population, the strength of the Revolutionary party has likewise increased. During 1901 the Socialists were not markedly aggressive in the chamber, but they were busy perfecting their organization throughout the country, and laying the foundation for the permanent establishment of their power when the constitutional parties should be definitely overthrown. The opponents of Socialism, however, were persistent in declaring that the extraordinary increase made by the party in parliament is not at all indicative of a like development in the sentiment of the country. Taking the election of 1900, in which the Socialists, together with Republicans, gained such a decided triumph, they point out that the success of both parties was due in large measure to a clever combination of their forces. In those districts where the Republicans outnumbered the Socialists, the two parties fused upon the Republican candidates, and the same was true of districts in which the Socialists were in the majority over the Republicans. As a result, Republican or Socialist deputies were elected from districts in which the Republicans or the Socialists by themselves were actually in the minority.

The Camorra in Naples.—The prestige of the Socialists was heightened by an event of local importance but of general interest, in which they were instrumental in bringing about wonderful results against tremendous odds. After 1895 enormous frauds in connection with the municipal government of Naples had come to public notice, and finally corruption penetrated so deep into the various departments of the city government that the general government intervened late in 1899, suspended the municipal authorities, and placed the city under a royal governor. At the same time a commission was appointed to investigate the various departments of the city government. The revelations of the commission established the fact that for a number of years the entire government had rested in the hands of a political machine known as the Camorra. The machine included the mayor of the city, the majority of the municipal council, the principal heads of the departments, and the great mass of the civil-service employees. The object of the organization was plunder, and in pursuit of this aim it availed itself of the most modern methods evolved by democratic government in large cities. Valuable franchises were given away without consideration, fraudulent contracts were entered into between heads of departments and friendly contractors, and directly, too, the municipal treasury was plundered. Public offices were put up at auction, and public officials were guaranteed a term of peaceful speculation, a large central fund being established for the purpose of defending the members of the machine in court if it ever came to that extremity. So firmly entrenched in power had the Camorra become that even after the results of the commission's investigations had been made public the leaders brazenly persisted in their conduct, and in the municipal elections which the general government ordered for 1901 the machine put up candidates for all the offices and carried on a vigorous campaign. Practically the whole press was with them, two of the leaders of the gang being a certain newspaper publisher, Mattucio Scarfoglio, and his wife, the celebrated novelist, Matilde Serao. The decent elements of the city united in the support of the candidates proposed by the government, but the Socialists were especially active, and to them was ascribed in great measure the result of the campaign. Sixty-four of the candidates nominated by the senators

and deputies of Naples were elected, and ten out of the twelve nominated by the Socialists. Of the candidates of the Camorra not one was chosen. European papers, and English newspapers especially, in commenting on the event, compared the overthrow of the Camorra in Naples with the defeat of Tammany Hall in New York, and drew distinctions which on the whole were favorable to the American machine.

France and Italy.—In foreign relations the year 1901 was important as marking a change in the relations between France and Italy on the one hand, and in the attitude of Italy toward the Triple Alliance on the other. On the occasion of a visit of President Loubet to Nice on April 8, an Italian squadron, under the command of the Duke of Genoa, the uncle of the present king of Italy, visited the harbor of Toulon; the duke was officially received two days later by the President, when there were great demonstrations of affection on both sides and a plentitude of compliments. As a result of this friendly visit, a general belief arose that the strained relations which for a long time have prevailed between Italy and France would be replaced by a closer *rapprochement* between the two nations, if not by an actual alliance. It was pointed out by those who favored such a consummation that any reasons that may have existed at some time or other for hostility between France and Italy had now disappeared. The dread of French predominance in the Mediterranean Sea vanished as Italy strengthened her own navy, and the other cause for ill-feeling between the two—the fear that France in the course of time would take possession of the coast of Tripoli, as it has done of Algeria and Tunis—was unfounded. Italian ambition has been largely directed toward the acquisition of Tripoli, based on no more solid sentiment, perhaps, than the memory of the time when Rome ruled over the African coast. On December 14, 1901, Signor Prinetti, speaking in the chamber, declared that he had received assurances from the French government that it would never intrench upon the Tripolitan territory nor stand in the way of Italian aspirations in that direction. It seemed on the whole, however, that there was no possibility of such a radical change as from concealed hostility to open alliance between the two powers; nevertheless the relations between the two had undeniably grown more friendly by the end of the year.

Italy and the Triple Alliance.—More important still was the discussion aroused by the approaching dissolution of the Triple Alliance (*q.v.*), which occurs in 1903. There were those who argued that in the same manner as all excuse for maintaining a hostile attitude toward France had disappeared, all cause for continuing the existence of the Triple Alliance had likewise gone. Those who opposed the renewal of the alliance dwelt upon the burden which it imposed upon the country in the way of maintaining an army far exceeding its actual need. The chief reason for Italy's entering into the alliance was the necessity of obtaining support against possible aggressions on the part of Austria, which in the early eighties was naturally hostile to Italian unity. Now that all danger from Austria was gone, there was no motive for prolonging so arduous a contract. Finally, it was argued that it was unreasonable to persist in an alliance which was obviously aimed against France, a country with which there was every reason to be on good terms. Those who favored the renewal of the alliance pointed out that the character of the alliance is essentially defensive, and that for twenty years it has acted as an influence for peace in Europe. The existence of the alliance was not incompatible with the maintenance of friendly relations with France, and at the same time Italy could not afford to abandon its old friends before it was perfectly assured of new ones who could aid it as Germany and Austria had done. In an interview with a representative of the *New York Herald*, on March 25, Premier Zanardelli declared that Italy would continue to perform its obligations under the existing alliance, and might consent to its renewal, but if it did so, it would be only for the purpose of preserving the peace of Europe. Its continuance, however, he hinted, would depend upon the willingness of Germany to abandon its hostile attitude in the matter of tariff legislation against Italian commodities.

IVORY COAST is a French colony in Africa with a southern sea-front on the Gulf of Guinea. Inland it extends north to the French Military Territories of the Soudan. The estimated area of the colony, including the native kingdom of Kong, which is under French protection, is estimated at about 125,000 square miles and the population 2,500,000. The colony is under the direction of a governor, whose seat was transferred in November, 1900, from Grand Bassam to Ajame. The transfer was made mainly because the old capital is not healthful. The name of the new capital was changed to Bingerville. The Ivory Coast is a flourishing colony; it needs no support from France, and the local budget balanced in 1900 at 1,403,000 francs. The main articles of export are coffee, coconuts, and rubber. Gold is found near Grand Bassam. The country is but little developed, and the government is taking active measures to promote industries. A commission that examined the forests of the interior has reported that in the section which it had traversed

there were precious woods to the value of \$241 an acre, not including rubber and palms. The commission added that if 10,600,000 cubic feet of precious woods—the load of 20 vessels—should be taken annually from the Ivory Coast, not a thousandth part of the forest wealth would be removed. Grand Bassam, the principal city, is situated on a good harbor. Other cities are Grand Lahou, Assinie, and Elimi. There has been considerable emigration of natives from the Ivory Coast to the Gold Coast, where their labor is needed in the mines; and alarmed at this, the French government passed a decree, in October, 1901, forbidding any person or company to transport natives from the Ivory Coast without the authorization of the governor. Companies organized to procure workmen for labor outside the colony had to pay transport duty for each workman of 100 francs. The fine for infraction of this law was placed at six months' to a year's imprisonment and a fine of 50 to 5,000 francs. There has been a reorganization of the system of justice in the colonies of the Ivory Coast, Dahomey, and French Guinea. In addition to the justices of the peace, who had previously dealt with civil cases and police cases only, there have been established courts of record of original jurisdiction at Conakry, Bingerville, and Porto Novo, and a superior court, consisting of a president and three judges, at Bingerville. These courts deal with criminal cases.

IWASKI, Baron YATARO, one of the commercial leaders of Japan and president of the Nippon Ginko, or Bank of Japan, was born on the island of Shikoku in 1856, the son of one of the trusted retainers of the Prince Posa. Taking up the schemes of his father, who had projected the extension of the shipping business of Osaka, he introduced steamships into the inter-island trade where only the primitive coasting junks had been in use. This company, the Mitsu Bishi, or "The Three Diamonds," developed rapidly, and a line from Japan to China, touching at Shanghai, was established. Later some of the ships of the Pacific Mail Steamship Company were purchased and the trade limits extended until at the present time practically every country in the world is reached. In 1881 he obtained control of the coal fields on the island of Takashama, where he has established a model community of mine workers. As head of the Bank of Japan he was officially intrusted with the task of changing the monetary system from a currency to a gold basis (1897).

JAMAICA, the largest of the British West Indian islands, lying ninety miles south of Cuba, constitutes, together with the Turks, Caicos, Cayman, and some other small islands, a British crown colony. The island of Jamaica has an area of 4,200 square miles and a population estimated in 1900 at 745,104. In 1891 the inhabitants numbered 639,491. The dependencies have a total area of 224 square miles and a population of 9,000. Three-fourths of the inhabitants are negroes and one-fifth mulattoes. Kingston, the capital and largest town, has a population of 48,500.

Government and Finance.—The colony is administered by a governor (Sir Augustus Hemming since 1898), assisted by a privy council and a legislative council of 29 members, of whom 5 are ex-officio, 10 appointed, and 14 elected. There are boards elected in each of the fourteen parishes for the administration of local affairs. The revenue of the colony increased from £677,064 in 1897 to £773,610 in 1900, and the expenditure in the same period decreased from £766,539 to £719,959. The public debt was £1,875,116 in 1899, in which year the imperial government loaned the colony the sum of £453,000. In March, 1901, it was estimated that the revenue for the year would be £745,836 and the expenditure £770,475.

For several years prior to 1899 the expenditure was considerably in excess of the revenue. In that year an imperial loan was made, and at the direction of the British colonial secretary increased stamp duties and an income tax were imposed. In order to assure the government of a safe majority in carrying out these measures, the governor was ordered to appoint, contrary to the established custom, the full quota of appointive members of the legislative council. This has caused continued opposition on the part of the elective members. At the opening of the legislative council in March, 1901, the elected members declared their willingness to support the government's fiscal policy, but asked for the withdrawal of the appointive members or the neutralization of their votes. The request was not granted.

Industries and Commerce.—The staple product is no longer sugar, but fruit, which it was estimated composed 45 per cent. of the exports in 1900. Oranges, pineapples, and bananas were the principal fruits exported, most of them going to the United States, which took in 1900 63.8 per cent. of the total exports of all kinds. Other leading exports (1899) were: Sugar, £150,311; rum, £104,295; and coffee, £162,219. The total imports increased from £1,660,667 in 1897 to £1,844,322 in 1899 and the exports from £1,448,443 to £1,868,080. The registered shipping of the island consisted in 1899 of 148 vessels of 8,843 tons. In 1900 there were 185 miles of railway, the receipts from which amounted to £116,348. Of the imperial loan £190,000 were allotted for railway purposes. Of the dependencies of Jamaica, Turks and Caicos islands, geographically belonging to the Bahamas, are the most important,

having an area of 165 square miles and a population of about 5,000. The chief industry is salt-raking, 2,000,000 bushels being annually exported, mostly to the United States.

JAPAN, an empire lying off the eastern coast of Asia, consists of the archipelago of Nippon, which includes the four large islands of Honshiu, Kiushiu, Shikoku, and Hokkaido (Yezo), together with Formosa (*q.v.*) and the Pescadores, ceded by China in 1895, and nearly 4,000 smaller islands. The capital is Tokio.

Area and Population.—The total area of the empire, according to official estimates, is 161,198 square miles and the population (January 1, 1899) 46,558,700, including Formosa, with 2,798,000 inhabitants, mostly Chinese. During the last few years the average annual increase in population has been about 500,000. Tokio had a population of 1,507,557 in 1900. Other large cities are: Osaka, population 1,311,763; Kioto, 931,568; Nagoya (1898), 244,145; Kobé (1898), 215,780; and Yokohama (1898), 193,762.

The constitution of Japan guarantees to the inhabitants absolute freedom of religion, and no particular sect receives state support. The predominating religions are Shintoism and Buddhism, but Roman and Greek Catholicism and the various Protestant churches have large followings. Elementary education is compulsory and is supported by the government. On January 1, 1899, there were over 28,000 schools with an enrollment of 4,250,000 pupils. Two universities at Tokio and Kioto are supported and controlled by the imperial government. The expenditure for education in 1900-01 was 4,478,278 yen.

Government.—The government of Japan, which prior to February, 1889, was that of an absolute monarchy, has, since the adoption of a constitution in that month, been a limited monarchy. The ruling sovereign, the Emperor or Mikado Mutsu Hito, who ascended the throne in 1868, retains extensive executive and legislative powers, but his authority is more theoretical than actual. He has the advice of a cabinet, the members of which are appointed by and are responsible to him. There is a privy council, the members of which deliberate on matters of state laid before them by the emperor. The emperor can declare war, conclude peace, and make treaties, and, with the consent of the imperial diet, exercise the legislative power. Every law, however, requires the consent of the diet, which consists of two houses—the house of peers and the house of representatives. The membership of the upper house is about 300, and comprises two classes—life members and representative members elected for seven years. The former consist of princes of the royal house, members of the higher grades of nobility, and those specially appointed by the emperor. The elected class consists of representatives of the nobility of lesser rank and members elected by the largest taxpayers in each prefecture. The house of representatives consists of 369 members, elected for four years by male inhabitants over 25 years old paying direct taxes of not less than 10 yen per annum. For local administration the country (except Hokkaido, which has a governor and a special administration, and Formosa, which is ruled by a governor-general) is divided into 46 prefectures, each having its governor and elected assembly.

Army and Navy.—The Japanese army is organized on modern lines, commanded by officers trained in the most approved western methods, and furnished with the most improved equipment. It is recruited on the basis of universal conscription of all males between the ages of 17 and 40, and the term of service is three years. In 1901 the army had a total peace strength of 143,649 officers and men, and a war strength, not including all the reserves, of 392,220. The militia numbered over 600,000, and there was a territorial army of 97,000. The government supports military academies and training schools for artillery, cavalry, and engineering corps, and manufactures its own firearms, ordnance, and ammunition at the arsenals at Tokio and Osaka. The military budget for 1901-02 amounted to 50,110,000 yen (\$24,954,780).

The navy is recruited on the same plan as the army, the term of service being four years. The personnel in 1899 included 24,012 officers and men. The fleet in 1901 consisted of 6 first-class, 3 second-class, and 4 third-class battleships, 14 coast-defense ships, 6 first-class cruisers, and 16 cruisers of other classes, and numerous gunboats, torpedo boats, and torpedo-boat destroyers.

Finance.—The monetary standard is gold and the unit of value is the yen, worth 49.8 cents. The revenue is derived chiefly from the land tax, tax on liquors, customs duties, posts and telegraphs, and stamp duties. The principal items of expenditure are those for army, navy, railways, and the interest on the public debt. Revenue and expenditure balanced in the budget of 1900-01 at 254,549,818 yen, and the estimated revenue and expenditure for 1901-02 were 254,519,515 yen and 252,933,420 yen respectively. The principal sources of revenue in 1900-01, according to the budget, were land tax, 47,338,520 yen; tax on saké (liquor), 55,465,767 yen; Chinese indemnity, 23,752,739 yen; posts and telegraph, 22,153,304 yen, and customs, 15,870,335 yen. The largest items of expenditure were interest on public debt and

fees, 28,190,210 yen; army, 37,309,975 yen; navy, 17,513,334 yen; and communications 17,507,512 yen. The public debt on March 31, 1900, was 502,967,249 yen. The principal circulating medium is the paper yen issued by the Bank of Japan. The note issue at the beginning of 1901 was 215,000,000 yen, protected by a gold reserve of 66,000,000 yen. The total coinage of the imperial mint from 1870 to December 31, 1900, amounted to 431,246,052 yen. On December 31, 1900, there were 2,364 banks of all sorts in Japan, representing a total paid-up capital of 508,534,009 yen (\$253,249,936). Of this amount the paid-up capital of the Bank of Japan was 30,000,000 yen, the Yokohama Specie Bank 24,000,000 yen, the Hypothec Bank of Japan, 10,000,000 yen, and the Taiwan Ginko 5,000,000 yen. The paid-up capital of 463 savings banks, all but one of which were native, amounted to 57,334,300 yen.

Industries.—The industrial conditions in Japan during the years 1900 and 1901 were not encouraging, and notwithstanding the efforts of Japanese statesmen and financiers to avert a crisis, a financial panic prevailed in April of the latter year in the central and southern provinces. According to Japanese authorities the real, though probably indirect, cause of the situation lay in the Chinese indemnity growing out of the war of 1894-95 and the issue of several large loans by the government. Many new enterprises were undertaken under the guaranty of these loans and in reliance upon the indemnity. The latter, however, proved insufficient, with the result that many millions of yen were diverted from the customary channels of trade to prevent their absolute failure. The undertakings, however, by increasing the amount of money in the hands of the laboring classes, raised the standard of living, and a consequent increase in the amount of imports followed. This increase, however, was unfortunately accompanied by a decrease in the volume of exports, which resulted in drawing 50,000,000 yen out of the country to settle Japan's balance of trade. Stocks, bonds, and other securities depreciated, and importers found themselves confronted with a glutted market, so that in 1900 trade came practically to a standstill, foreign investments practically ceased, the government encountered difficulty in floating a foreign loan, and both foreign and native banks refused to lend on personal credit. The total investments of the banks in 1900 amounted to more than their total paid-up capital, a fact to which the minister of finance, Watanabe, early in 1901 attributed the business depression.

Japan is a very mountainous country and not more than one-sixth is available for cultivation. Methods of agriculture are improving, and the government supports an agricultural college as a branch of the University of Tokio. Rice is the principal agricultural product, the crop of 1899 being 39,590,322 koku (1 koku = 4.96 bushels). Other products were: Barley, 8,407,263 koku; wheat, 4,957,670 koku; and rye, 6,606,277 koku. The manufacture of silk, cotton, and other textiles is one of the principal industries, and the product increased in value from 71,365,218 yen in 1894 to 143,739,198 yen in 1898. Cotton yarn in 1898 was manufactured to the amount of 33,546,489 kwan (1 kwan = 8.28 pounds). The camphor industry of the island of Formosa is a government monopoly, over five-sixths of the camphor of the world being produced there. Other important products growing annually in value are petroleum and fish. The forests produce valuable timber. Coal, iron, gold, silver, and copper abound, although the mining industry has never been properly developed.

Capital invested in business companies of various sorts increased from 1895 to 1899 by about \$215,361,000, or adding the value of debenture bonds of various joint-stock concerns, \$223,058,000. The increases were as follows: Agricultural companies, \$761,000 to \$1,143,000; commercial and financial companies, \$49,893,000 to \$167,751,000; manufacturing companies, \$29,364,000 to \$73,891,000; transportation companies (sea and land), \$44,980,000 to \$99,073,000.

Commerce.—Although the year 1900 was considered unfavorable to the commercial and manufacturing interests of Japan, there was no evidence of it in the trade statistics, which show a considerable increase in the volume of foreign trade over both 1898 and 1899. The imports and exports for the three years are shown in the following table, the values being given in yen:

	1898.	1899.	1900.
Imports	277,502,000	220,401,925	287,580,283
Exports	165,753,752	214,929,894	204,630,335

Since 1891, when the total imports were 62,029,912 yen, there has been a steady annual increase, except in the year 1899, when the trade was affected by the over-exportation of 1898, caused by the knowledge that a new tariff law was to go into effect in the year following. At the same time the value of the imports over the exports has been increasing annually, although figures for the first eight months of 1901 would indicate that it had been checked at least temporarily. The imports for that period were 181,000,000 yen as compared with 207,000,000 for the first eight months

of 1900, and the exports increased from 123,000,000 yen to 156,000,000 yen for the same period.

The principal exports in 1900 were: Raw silk, 44,700,792 yen, which decreased from 62,627,720 yen in 1899; silk tissues, 22,944,670 yen; cotton yarn, 20,609,438 yen; copper, 12,738,407 yen; tea, 8,933,149 yen; cotton tissues, 6,085,950 yen; straw plait, 4,029,103 yen; rice, 3,589,073 yen, a decrease from 10,282,011 in 1899; and floor matting, 3,313,286 yen. Nearly one-quarter of the whole volume of trade is with the United States, which furnished 21.9 per cent. of the imports in 1900. Of the exports the United States took over one-half of the raw silk, a large part of the silk tissues, nearly all of the floor matting, and three-fourths of the tea. Nearly all of the cotton yarn and tissues go to China, Corea, and British India, while the greater part of the copper is sent to Hong Kong. During 1900 gold and silver coin and bullion were exported to the amount of \$28,240,117 (56,762,635 yen), while the imports amounted to \$5,735,882, leaving a net export of \$22,504,235.

The trade of Japan with the countries of greatest commercial importance for the years 1899 and 1900 was as follows, in yen:

Country.	Imports to Japan.		Exports from Japan.	
	1899.	1900.	1899.	1900.
United States	38,215,894	62,822,700	63,919,270	52,517,908
China	28,687,730	29,990,100	40,257,034	31,902,808
Great Britain	44,830,993	71,708,424	11,270,770	11,274,033
British India	43,883,885	23,539,395	6,062,049	8,712,847
Hong Kong	7,338,454	10,670,300	34,291,307	39,215,847
France	5,768,180	8,103,751	29,247,837	19,169,189
Germany	17,613,191	29,228,310	3,796,927	3,559,096

The import trade of Great Britain with Japan has not increased in the same proportion as that of other foreign countries. Although there was a substantial increase in 1900 over 1899, the increase over 1898, when the value of the imports was 62,707,572 yen, was not so marked. Of the total imports of about 53,000,000 yen in 1893, the first year in which countries were discriminated in Japanese customs returns, considerably over one-half were British goods, while in 1900 less than one-fourth of the imports were British, while on the other hand the imports from the United States and Germany show a proportionally large increase.

The shipping statistics of Japanese ports for 1899, exclusive of the coasting trade, showed a total of 3,403 ships of 3,608,494 tons entered and 3,549 ships of 3,777,716 tons cleared. About one-third of the tonnage was British.

Communications.—On January 1, 1900, there were 3,628 miles of railway in operation in the empire, of which 2,805 miles were operated by private corporations and 833 miles by the State. During 1899 permanent charters were granted for 170½ miles and provisional charters for 261½ miles, showing a decrease in activity of construction of over 66 per cent., as compared with 1898. This decrease is probably due to the prevailing depression in commercial and financial circles. In addition to the lines already in operation, the government has planned to construct 1,230 miles of road, and private companies hold charters providing for the construction of 2,483 miles more, a total additional mileage of 3,713 miles. Building on these lines will probably begin as soon as the financial situation improves. The government has already paid upon the state railways the sum of 69,679,049 yen (\$34,700,166), and the total paid-up capital of the private companies amounts to 173,667,846 yen (\$86,486,587). The government expended for railway locomotives alone over 2,240,000 yen in 1900, mostly imported from Great Britain and the United States. During 1901 the government was constructing car-shops and locomotive works at Kobé, and will build most of its own rolling-stock in the future. Two-thirds of the steel rails used in Japan are imported from the United States. In May, 1901, the construction of an elevated railway in Tokio was begun. The road is modeled after that in Berlin, Germany, and will cost, when completed, 5,680,000 yen.

HISTORY.

Legislative and Ministerial.—Early in the year 1901 the ministry of Marquis Ito, which had succeeded that of Marquis Yamagata in September, 1900, proposed a financial scheme which roused strong opposition in the house of peers. The proposition was for an increase of taxes on spirits, tobacco, sugar, beer, etc., to meet the increase of expenditure entailed by the Chinese crisis. The peers took at once an uncompromising attitude, which was generally regarded as a protest against the system of party government as represented and championed in particular by Marquis Ito. In March, when it had become evident that a compromise was impossible, the emperor used his prerogative and intervened, with the result that the peers reluctantly gave their consent to the bill, although their hostility to the ministry continued.

In April, 1901, Viscount Watanabe, the minister of finance, announced that certain state enterprises, including the extension of telegraph, telephone, and railway lines, the construction of which Parliament had already provided for, would have to be abandoned because of the impossibility of floating the loans necessary to carry them out. This was the occasion for a new attack on the Ito ministry, it being charged that a different financial programme would not have placed the country in such a predicament. The opposition to Watanabe culminated in the resignation of the entire Ito ministry on May 2. On June 3 Viscount Katsura (*q.v.*) formed a ministry composed largely of peers having no connection with either of the political parties, but retaining General Kodama and Admiral Yamamoto, who had been respectively minister of war and of marine in Marquis Ito's cabinet. The rest of the ministry, as constituted by Viscount Katsura, was as follows: Minister for foreign affairs, Jutaro Komura; agriculture and commerce, Tosuke Hirata; the interior, Tadakatsu Utsumi; finance, Arasuke Sone; education, Dairoku Kikuchi; justice, Keigo Kiyoura; and communications, Akimasa Yoshikawa. On June 21, 1901, Mr. Hoshi Toru (*q.v.*), who had resigned from the Ito ministry in December, 1900, because of attacks on his official integrity, and was then chosen leader of the Liberal party in the house of representatives, was assassinated. The assassin, who declared that he acted for the good of the country, was sentenced to life imprisonment. In October the Katsura ministry secured the consent of Parliament to the issue of bonds to the amount of 16,500,000 yen, which, it was understood, would be bought by the Bank of Japan, and the proceeds applied to the redemption of other bonds to the amount of 8,000,000 yen, and to defraying the expenses of the Chinese expedition of 1900-01.

Foreign Affairs.—The Japanese attitude toward China was stated early in the year by Mr. Kato, Marquis Ito's minister for foreign affairs, and the policy then outlined was adhered to by the ministry of Viscount Katsura. The Japanese objected to the proposed prohibition of the importation of arms and ammunition into China, unless the European powers were prepared to unite in guaranteeing China's integrity and independence. They also objected to Russia's policy in regard to Manchuria, and sent a remonstrance to St. Petersburg on the subject. It was stated that Japan would use every effort to restore order in China and organize a stable government. See *COREA* and *RUSSIA*.

The princess imperial gave birth to a son on April 29, 1901, thus insuring an heir to the throne in direct descent.

JASPER, JOHN, American colored preacher, died at Richmond, Va., March 30, 1901. He was born a slave in Fluvanna County, Va., July 4, 1812, and in his boyhood worked on a plantation. At twenty he was converted to religion and learned to read and write in order to preach. In 1868 he organized the Mount Zion Church at Richmond, which grew to be the largest negro congregation in the South, and remained its pastor until his death. It was before this congregation, in 1878, that "Dr." Jasper preached his famous sermon, in which he attempted to prove that the sun travels around the earth. Taking as the basis of his argument the fact that Joshua commanded the sun, "Stand thou still!" (Joshua, x., 12) for a time, he fortified it with numerous scriptural quotations, the conclusion being that "the sun do move." The sermon was printed in a local newspaper, and afterward copied all over the United States and Europe, in many cases leading otherwise rational men into absurd discussions as to the reasonableness of the Copernican system. Jasper was hailed as a renowned astronomer and was invited to many parts of the country to expound his "sun do move" theory, but with the exception of one short tour remained at home, where he repeated his sermon periodically to throngs of visitors and with picturesque oratory defended his position to the last.

JAVA, the most important island in the Dutch East Indies (*q.v.*), has an area, with the adjacent small island of Madura, of 50,554 square miles, and an estimated population of over 26,000,000, of whom, in 1897, 52,000 were Europeans and 250,000 Chinese, the greater part of the inhabitants being Malaysian. The chief port and seat of the Dutch Indian colonial government is Batavia, with a population of over 115,000. For administrative purposes Java and Madura are divided into 22 provinces, each governed by a resident, appointed by the governor-general of the Dutch Indies, and assisted by an assistant resident and *contrôleurs*. The government is highly centralized, and the budget of every town and province is prepared under the direct supervision of the governor-general.

The chief products of the island are agricultural, the most important being coffee, cinchona, tea, sugar, and tobacco. The coffee production in 1898 amounted to over 43,000,000 pounds. The system of agriculture, known as the "culture system," which prevailed in Java for many years, and by which natives were compelled to sell their crops to the government below their market value or give time or a portion of their products to the state, has been gradually discarded. The length of the railway lines in Java in 1898 was 1,075 miles, of which 980 miles belong to the state.

Volcanic eruptions in May and June, 1901, resulted in the destruction of a number of plantations and the death of several hundred natives and a few Europeans.

JEWS. The total estimated number of Jews, as given in the *Jewish Year Book* of London for 1901-02, is 11,242,665, as compared with 11,210,415 for the previous year. Of these there are in Europe 9,351,730; in Asia, 368,000; in Africa, 403,800; in America, 1,058,135; and in Australia, 16,000. In this estimate Russia leads the countries of the world with 6,000,000 (5,700,000 by the census of 1897), Austria-Hungary holding the second place with 1,868,000. The *American Jewish Year Book* for 1901-02 places the total at 10,766,749, and the *Zeitlexikon* for December, 1901, gives the obviously low estimate of 8,700,000, placing the number of Jews in Russia at 4,000,000. The two most numerous Jewish communities in the world, according to the same publication, are those of New York, with 350,000, and of Warsaw, with 230,000 persons.

On the whole, the history of the Jews for the year presents a somewhat brighter aspect than that of the preceding year. In Russia, it is true, the chronic student disturbances were responsible for a further curtailment of the very limited rate of admission for Jewish students to the universities. On August 9, 1901, the ratio of 3 per cent. of the total student registration was made uniform for all universities except that of Moscow, where admission was suspended altogether.

In Roumania, the Liberal ministry of Carp was overthrown in April, after a short-lived existence, and the inveterate anti-Semite Sturdza became the head of the new ministry. The cruel reprisals which are being carried out against the Jews, as "aliens," were a subject of discussion in the British House of Commons, as such treatment is in direct violation of Article 44 of the Treaty of Berlin. The emigration from Roumania continued undiminished, but the hardships prevailing during 1900 were not so noticeable, owing to better regulations, chiefly through the efforts of the "Montefiore" Association and the Jewish Colonization Association. On June 17 the *Alliance Israélite Universelle* called a conference of representative Jews from all parts of the world, at which the best means of relief for the Roumanian emigrants were discussed and vigorous action was decided upon. In spite of this and of anti-Semitic outbreaks here and there in Europe, the year as a whole was one to which the Jews may look back with comfort, owing to the general display of hostility to such outbreaks and the readiness of those in-power to suppress them.

In Smyrna the everlasting "blood" accusation reappeared. A Christian lad disappeared about Easter time, and on March 22 riots broke out, but the governor-general and the Greek bishop were instrumental in checking them at the outset. The alleged martyr was found and paraded through the city streets to prevent further disturbances. In Teheran a Mohammedan mob attacked the Jewish quarters, but order was promptly restored through the intervention of foreign representatives. The Shah sent a contribution to the relief fund and dismissed the officials directly answerable for the trouble. The anti-Jewish demonstrations among the students of the University of Budapest were insignificant. On April 19 the Vienna Court of Cassation (in the notorious Polna case of "blood-accusation"), quashed the charge of murder for ritual purposes brought against Hülsner, though finding him guilty of homicide. The emperor refused to confirm the sentence of death. The famous Jew-baiter, Max Régis, was forced, on July 2, to resign from the mayoralty of the city of Algiers and to give up his seat in the municipal council. Almost upon the heels of this followed his condemnation and imprisonment. In Prussia certain remarks made by Minister of Justice Schönfeldt, during the January sessions of the Diet, led the representatives of the Jewish communities of Königsberg, Berlin, Hanover, Frankfurt-on-the-Main, Stettin, and Posen to address petitions to Chancellor von Bülow urging statutory enactment for equal rights of the Jews. The Central Union of German Citizens of Jewish Faith entered, on February 28, a protest against the debates about the Jews in the Prussian Diet. Furthermore, a *Hilfsverein der Deutschen Juden* was formed to carry on in Germany the work hitherto done by the *Alliance Israélite Universelle*. In England the most important feature of the year in the life of the Jews was the establishment of greater cordiality in the relations of the so-called "reformed" and orthodox members of the community. A readiness on the part of one faction to give up some of the most radical innovations, and on the part of the other to dispense with survivals of mediæval fanaticism, was noticed during the previous year, and the work of reconciliation continued during 1901.

Relaxation of Established Doctrines.—Though primarily of local interest only, the following two decisions were most significant as bearing upon questions involving the Jews as a body. The motion to hold service on Sunday instead of Saturday was rejected by a sweeping majority of the representatives of various congregations, at Berlin. A similar fate overtook the proposition made at the twelfth annual meeting (July 2-6, 1901, Philadelphia, Pa.) of the Central Conference of American Rabbis, to make the study of the life and teachings of Christ a part of the curricu-

lum of Jewish religious schools. Though the motion was rejected, the very fact that such a proposition was at all submitted to a Jewish assembly is indicative of the degree to which the spirit of liberalism has permeated the religious life of the Jews.

Zionist Congress.—The fifth Zionist Congress was held at Basle, Switzerland, on December 26-29, 1901. On the opening day some 900 telegrams of greeting (among them one from the Sultan of Turkey) were received from all parts of the world. Among the 268 delegates present the following participants of note may be mentioned: Dr. Theodor Herzl, Herr Oscar Marmorek, and Dr. Alexander Marmorek, from German-speaking countries; Max Nordau, of France; Sir Francis Montefiore, Israel Zangwill, and D. Wolffsohn, of England; Kohan-Bernstein and Professors D. Mandelstamm and Belkofsky, of Russia, and Professor Richard H. Gottheil, of the United States. The secretary's report showed an income of 146,314 francs; the chief items of expenditure were 92,187 francs for propaganda, 12,693 francs for press subventions, and 16,068 francs for the expenses of the fourth congress. The sessions showed the existence of two well-defined parties among the Zionists. One, led by Herzl, puts political agitation at the head of the programme, and the other stands for culture as the prime factor in the regeneration of Zion. It required all the tact and parliamentary skill of Dr. Herzl to prevent a serious rupture between these factions. He announced that at the audience granted on May 17 by Sultan Abdul-Hamid to Herr D. Wolffsohn, chairman of the Jewish Colonial Trust; Herr Oscar Marmorek, secretary of the actions committee, and himself, he was authorized to proclaim the deep interest taken by the Mohammedan ruler in the Zionist movement. Though no definite promises were made, the mere fact that Herzl was granted an audience—a distinction rarely conferred on foreigners—is pointed to by the promoters of Zionism as an event auguring well for the future. The addresses that elicited most discussion were those of Nordau and Zangwill. The latter made an impassioned attack upon the Jewish Colonization Association (at present managing the former Rothschild colonies in Palestine), an attack which met with severe criticism in many quarters.

Agricultural Colonies.—Preliminary work on the first Jewish agricultural colony in Germany was begun during the summer. A parcel of land was bought, on which a specialist was to begin the work of spreading the knowledge of agriculture among the Jews of Germany. The colonies in Argentina and North America were barely struggling along, while those in Palestine were described by Ginzberg as on the verge of ruin. Sent to Palestine by the Odessa (Russia) Committee for the Promotion of Agriculture, he spent some six months in studying the situation, and published the results of his exhaustive investigation in a Russian (the *Voskhod*, of St. Petersburg) and a Hebrew (the *Hashiloakh*, of Warsaw) periodical. It appears that the management of the Rothschild colonies has been conducted in a spirit of mingled feudalism and philanthropy, and has resulted in killing all initiative on the part of the settlers. After twenty years of existence, the colonies are in a miserable plight.

Literary Events and Jubilees.—The first volume of the *Jewish Encyclopedia* (Funk and Wagnalls, New York) was received with general praise, realizing, as it did, most of the sanguine expectations placed in it by many. Mechanically it is a splendid volume, and contains many valuable articles by specialists. Unfortunately, the prosecution of the work was temporarily suspended after the publication of the first volume. A collection of 375 *Popular Songs of the Jews in Russia*, in Yiddish, with a transliteration in German characters, was published by S. Grusberg and P. Marek at St. Petersburg (1901). It is a pioneer work in the line of Russian-Jewish folklore, and is to be followed, in the near future, by other collections and works of a similar nature in other lines of ethnography. On March 2 the famous orientalist, Dr. Adam Harkavi (in charge of the Semitic section of the Imperial Library of St. Petersburg) completed the fortieth year of literary activity, and on March 10, Dr. Adolf Neubauer's seventieth birthday was celebrated by many of his friends and admirers.

The Jews in the United States.—The *American Jewish Year Book* for 1901-02 gives the number of Jews in the United States as 1,045,555, an apparent decrease from 1,058,135 of the previous year, but really due to more conservative treatment of statistics. Of the total, 400,000 reside in the State of New York, 95,000 in Pennsylvania, 75,000 in Illinois, 60,000 in Massachusetts, and 50,000 in Ohio. The notable occurrences in the life of the Jews in the United States were: The twelfth annual meeting of the Central Conference of American Rabbis, held at Philadelphia, Pa., on July 2-6. The fifth summer assembly of the Jewish Chautauqua, at Atlantic City, N. J., July 7-28, the financial statement showing the receipts to be \$4,392.36 and the disbursements \$3,939.54, a balance of \$452.82; 15 new Chautauqua circles were added during the year. The first executive session of the Council of Jewish Women took place at New Orleans, La., February 17-23; thirty-two delegates were present; in June, 1901, there were 63 sections, with 7,000 members, a gain of 1,800 in one year. The seventeenth council of the Union of American Hebrew Congregations met at

Cincinnati, O., January 15, 1901. Its twenty-seventh annual report (January, 1901) shows a roll of 102 affiliated congregations, with about 11,000 members, and income of \$38,673.83. Of the five American branches of the *Alliance Israélite Universelle*, that of Baltimore, with 115 members, had its annual meeting on March 3; \$400 were sent to the central body, and \$700 collected for the Roumanian sufferers. The Philadelphia branch sent 2,484.10 francs to the Paris treasury, and the New York branch was reorganized on April 23 by M. Nissim Béhar, a representative sent from Paris.

JOHNS HOPKINS UNIVERSITY, Baltimore, Md., organized 1876. On the 22d of February, 1901, President Gilman's formal resignation of his office was presented, to take effect September 1. On June 3 the trustees elected as president of the University, Ira Remsen, Ph.D., LL.D., for twenty-five years professor of chemistry and director of the chemical laboratory of the university, and he assumed the duties of the presidency September 1, 1901. During 1901-02 the academic staff numbers 144, including 65 in the medical school. Of the 687 students, 523 are graduate students (174 being enrolled in philosophy and arts and 349 in medicine), and the remainder include 158 matriculates (candidates for the degree of B.A.), and 6 special students. The university library numbers 101,997 volumes, a gain for 1901 of 7,627 volumes, and about 100,000 pamphlets. Over 1,500 periodicals are regularly received. Among important accessions may be mentioned 3,600 volumes and many pamphlets from the library of the late Professor Herbert B. Adams (*q.v.*), on history and education. The works of Frederick the Great, in 30 volumes, were presented by the German emperor, in recognition of the researches of Professor Haupt, of the Oriental Seminary. The university received from Mr. Theodore Marburg a rare collection of gems and intaglios from Cyprus. By the munificence of several public-spirited citizens of Baltimore, notably Messrs. William Wyman and William Keyser, the university has come into possession of a suburban site within the city limits, and less than two miles from the centre of the city. The tract contains about 140 acres of beautifully diversified land, and adjoins 40 acres given by the same gentlemen to the city for a public park. It is hoped that generous gifts for buildings, and to the general fund of the university will soon be made, and that a removal to the new site will be effected in the course of a few years. The several publications have reached the following points of issue: *American Journal of Mathematics*, Vol. XXIV; *American Journal of Philology*, Vol. XXIII; *American Chemical Journal*, Vol. XXVII; *Studies in Historical and Political Science*, Series XX; *Journal of Experimental Medicine*, Vol. VI; *Modern Language Notes*, Vol. XVII; *Biological Memoirs*, Vol. IV; *Contributions to Assyriology*, Vol. IV; *Journal of Terrestrial Magnetism*, Vol. VI; *University Circular*, No. 156. In addition, a number of important works are under way, including the Hebrew text of the *Polychrome Bible*. A chromophotographic reproduction of the manuscript of the Kashmirian Atharva-Veda, undertaken by Professor Bloomfield, has recently appeared.

JOHNSON, ALBERT L., American street railway promoter, died in New York City, July 2, 1901. He was born in Kentucky, in 1861, and began his business career, with his brother, Tom L. Johnson (*q.v.*), as an operative on a street railway at Indianapolis, Ind. From that place he went, while a young man, to Cleveland, O., where, still with his brother, he gained control of valuable franchises. Later he went to New York City and organized the Nassau Railroad Company in Brooklyn, and tried to obtain concessions for a system of trolleys in New York City and its suburbs with a uniform fare of three cents. He was interested in the construction of an underground road in London, and at the time of his death was agitating for franchises to build a tunnel in New York City, connecting the boroughs of Brooklyn, Manhattan, and Richmond. Another project ended by his death was that of connecting New York City and Philadelphia by a trolley system. Mr. Johnson was, like his brother, an ardent advocate of the single-tax theory.

JOHNSON, TOM LOFTIN, widely known as an advocate of the single-tax theory and of the municipal ownership of public utilities, was elected mayor of Cleveland, O., in 1901, on a combined platform of those principles. He was born at Georgetown, Ky., July 18, 1854, and was educated in the common schools of Indiana, where he went as a boy. As a clerk he worked in a street railway office at Louisville, Ky., from 1869 to 1875, and while there invented a number of street railway devices which were profitable to him. Later he acquired a street railway at Indianapolis, adding soon after large holdings in the same kind of property at Cleveland, O., Detroit, Mich., and Brooklyn, N. Y. He was associated with his brother, Albert L. Johnson (*q.v.*), in most of these enterprises, and also added the business of an iron manufacturer to his other activities. From 1891 to 1895 he served as a Democratic member of Congress, and it was while there that his advocacy of the single-tax theory attracted general notice.

JOHNSTON, Sir HARRY HAMILTON, British explorer and scientist, discovered the okapi, a new species of African zebra, in 1901, and has published a number of papers describing the animal (See MAMMALOGY.) He was born at Kensington, Surrey, June 12, 1858, and was educated at King's College, London. He has held several colonial positions in Africa, and since 1899 has been special commissioner to Uganda. In 1880 he traveled through Tunis and Algeria; in 1882-83 he explored the River Congo and other parts of West Africa; and in 1884 he led an expedition to Mount Kilimanjaro, in East Africa. He surveyed a portion of the Niger delta in 1887, and in 1889-90 visited the lakes Nyassa and Tanganyika, to bring about peace between the Arabs and the African Lakes Company. A year later he was appointed commissioner and consul-general in British Central Africa, and in 1897 he became consul-general of the regency of Tunis. Numerous scattered papers and reviews have appeared under his name, on matters connected with his travels and with natural history and politics. Among his published volumes are: *The River Congo* (1884); *The Kilimanjaro Expedition* (1886); *The History of a Slave* (1889); *Life of Livingstone* (1891); and *British Central Africa* (1897). Early in life he studied art, and in 1876 he was a medallist of the South Kensington School of Art. He has also exhibited frequently at the Royal Academy and other galleries.

JOHORE, an independent Malay state at the southern extremity of the Malay Peninsula, has an area of about 9,000 square miles and an estimated population of 250,000, which is constantly increasing through Chinese migration. Its capital is Johore-Bharu, 15 miles north of Singapore. The government is more independent than that of the Federated Malay States (*q.v.*), which it adjoins, being in the hands of a sultan, under whom the country is administered by district headmen; but in its foreign relations the state has been since 1885 controlled by Great Britain. The revenue is chiefly derived from import and export duties. The principal exports are gambier, tobacco, sago, coffee, tea, and gutta-percha.

JONES, JOHN VRIAMU, F.R.S., physicist, principal and professor of physics in the University College of South Wales and Monmouthshire, died June 2, 1901. He was born at Swansea in 1856, and was educated at University College, London, where he won numerous prizes, medals, and scholarships. At the age of 25 he was appointed professor of mathematics in the Firth College, Sheffield, and two years later was made principal of the University College of South Wales, which he developed to a high degree of excellence, and for which he secured a new site and building. He devoted much time to researches dealing with the determination of electrical standards and used a modified form of the Lorenz apparatus in determining the coefficient of mutual induction. In 1890 he found that the true value of the ohm was the resistance of 106.307 centimetres of mercury, one square centimetre in cross-section at 0° Centigrade, and later, by improved methods, was able to measure low resistances with an unusually high degree of accuracy. From these and other experiments he found the value of the British Board of Trade ohm in terms of the true ohm. He also devised a new form of ampere balance, which was to have been constructed from his designs, and was greatly interested in the equipment of the new British National Physical Laboratory, particularly as regards its electrical standards.

JUNE, JENNIE, pseudonym of Jane Cunningham Croly (*q.v.*).

KAMERUN. See CAMEROON.

KANSAS, a central western State of the United States, has an area of 82,080 square miles. The capital is Topeka. Kansas was organized as a Territory, May 30, 1854, and admitted as a State, January 29, 1861. The population in 1900 was 1,470,495, while in June, 1901, as estimated by the government actuary, it was 1,477,000. The four largest cities and their populations in 1900 were: Kansas City, 51,418; Topeka, 33,608; Wichita, 24,671; and Leavenworth, 20,735.

Finance.—The receipts of the State treasury for the year ending June 30, 1901, were \$3,693,945.45; the expenditures were \$3,627,030.82, leaving in the treasury, in connection with a previous surplus, \$577,625.99. During the year payment was made on the Quantrell Raid Claims amounting to \$76,660.50. The State debt at the end of the year amounted to \$632,000, represented by bonds held by State school funds. There was paid on the State debt during the year \$61,966.86. The State tax rate for the year was 5.25 mills on the dollar, and the total value of property in the State, as returned for taxation, was \$328,728,008, which represented about one-third of the market value of the property.

Industries.—Although agriculture and stock raising are the leading pursuits of Kansas, the manufacturing and mechanical industries have increased largely in the last 40 years. From 1860 to 1890 the population increased from 107,206 to 1,361,263, or 1,269.8 per cent. In the same period the number of industrial employees increased from 1,735 to 35,193, or 1,928.4 per cent. From the report of the census it appears that in 1900 the amount of money invested in industrial concerns in Kansas, exclusive

of capital stock, was \$66,827,362, 7,839 establishments reporting. The gross value of manufactured products for the year was \$172,129,398, and if from this sum is deducted the value of products re-used in the process of manufacture, the net value of the manufactured products is found to be \$136,096,926. As in most States, the relative importance of the industries in Kansas results from the relative value of the agricultural interests. Slaughtering and meat packing is the most important industry of the State, forming an auxiliary to stock raising. The products of this industry were valued in 1900 at \$77,411,883, or 45 per cent. of the total value of the products of the State. Kansas City contributes a large part of this total, being the second largest meat-packing city in the world. Allied to slaughtering and meat packing is the manufacture of soap and candles from what would otherwise be waste products. These products were valued at \$3,362,530 in 1900, and also showed an increase of 327 per cent. during the decade. Another industry that has resulted from stock raising is that of the factory manufacture of cheese, butter, and condensed milk. These products were valued at \$3,362,530 in 1900, and also showed an increase of nearly 300 per cent. since 1890. Good railroad facilities, making it possible to collect cream from scattered sub-stations, have aided this industry, which has proved especially valuable to the small farmer and stock raiser. The flour and grist milling industry of Kansas has only increased since 1890 25.9 per cent. And while it is the second largest industry of Kansas, the product for 1900 being valued at \$21,926,768, the increase is small—out of proportion to the amount of wheat raised in Kansas. The amount of this wheat in 1900 was 82,486,655 bushels, or 3.3 per cent. of the wheat crop of the world. Only 24 per cent. of this crop was ground by mills in the State, the reasons being given as the growing inability of the small mills to cope with the larger ones in the manufacture of flour products, and also discriminations in freight rates. Car construction and general railroad shop work holds third place among the manufacturing industries of the State, the value of the products in 1900 being \$6,816,816. This industry showed the satisfactory increase of 87.1 per cent. since 1890. The smelting and refining of zinc in Kansas has grown 500 per cent. since 1890. This great increase is owing to the presence of zinc ores in the same locality with an abundant supply of fuel—both bituminous oil and gas from the gas and oil fields opened up in southern Kansas. The products of this industry were valued at \$5,790,144 in 1900.

Ballot Law.—By an amendment to the ballot law in 1897, the legislature endeavored to discriminate against the fusion of political parties in the State. The law of 1897 prohibited an elector from voting a straight ticket by making a single X at the top of the column on which was the list of the party candidates. Each candidate had to be voted for separately. By the amendment of 1901, electors were permitted to vote in either way; that is, to vote for the ticket as a whole or for each candidate separately. But the principal effect of the law of 1901 was to prohibit fusion tickets. A political party was enjoined from choosing an appellation consisting of more than two words, of which one word was required to be the word "party." A political party was likewise prohibited from taking any appellation or emblem or any part of an appellation belonging to any other political party, and a candidate for office was prohibited from accepting the nomination for office from more than one political party. If, however, two parties persisted in nominating the same man as candidate, then, after the candidate had refused one of the nominations, as required by the law, the party whose nomination he refused was prohibited from placing the name of the candidate on its official ballot. And if the elector wished to vote for this candidate for office, he could only do so by placing an X against every other candidate for whom he desired to vote and writing the name of this candidate in the column marked "Independent nominations."

Labor Laws.—An act much like one passed in Connecticut (*q.v.*) provided for the appointment of a director of free employment, who should see to it that in every city of over 2,000 inhabitants there was established and maintained a free employment bureau for bringing together employers and laborers; and it was declared to be the strict legal right of every person desiring employment to register at his local registry free from any charge or expense whatever. The State director was especially ordered to secure from the rural districts lists of the numbers of extra laborers needed during the harvest season, and to fill this demand as far as possible, and in general to provide employment for any laborer seeking it. The act of 1886 requiring all officers of the State or of any political subdivision of it to give preference, in making appointments, to soldiers and sailors of the Civil War, was increased in scope and effectiveness in 1901 by prescribing that officials, before making any other appointments, should thoroughly investigate any applications made by ex-soldiers and sailors, and if the officials did not do this, they were to be liable to impeachment for misdemeanor in office. The managers of all mercantile establishments, stores, hotels, and restaurants were required to furnish seats for their women employees, and permit the women to use these when not actively employed in the discharge of their

respective duties. A clearly discriminative act, comprising in effect special and class legislation of the most pronounced type, was that prescribing that the receiver for the estate of any person, company or corporation should allow as a preferred claim, to take precedence of any and every other claim, wages due to laborers and employees, other than officers of the company, accruing within six months preceding the assignment or the appointment of the receiver. An act making further provision for the health and safety of miners provided that all worked-out or abandoned portions of operated mines should be securely blocked off from the operated portions; and it was made the duty of every county attorney, upon penalty of forfeiture of his office, promptly to apply for an order from the court suspending operations in any mine upon the application of the State mine inspector, together with his statement that the mine was in a dangerous condition by reason of improper ventilation, the escape of gas or inadequate stairways or means of escape.

Parole of Prisoners.—A comprehensive system for the parole of prisoners was enacted by the legislature, as follows: The court convicting any prisoner other than one convicted of treason or murder in the first degree, was directed to furnish to the warden of the penitentiary all known facts concerning the prisoner, his parentage and history, and the probability of his ultimate reformation, and these facts should be supplemented by others ascertained by the prison authorities. On the basis of this information, and whenever the governor should deem it wise, prisoners might be paroled. The prisoner should then every month communicate to the warden, giving the facts of his present life and employment, and the warden might obtain further information from the sheriff of each county. But no prisoner might be paroled twice, and during his parole he was required to abstain entirely from evil habits, or his parole might be recalled, in the governor's discretion.

Practice of Medicine.—Prior to the act of the legislature of 1901, the main law regulating the practice of medicine in Kansas was one of 1870, which merely made it obligatory upon practitioners to have graduated from some respectable school of medicine. The law of 1901 provided for the appointment of a State board of medical registration and examination, who should issue certificates permitting applicants to practice, provided only that they had graduated from a medical school of recognized standing, as determined by the board, or in lieu of that, had studied medicine for four years and passed an examination satisfactory to the board. But graduates of a legally chartered school of osteopathy might be permitted to practice, and the act further specifically permitted Christian Scientists to practice, asserting that "nothing in this act shall be construed as interfering with any religious beliefs in the treatment of disease, providing that quarantine regulations relating to contagious diseases are not infringed upon."

Liquor Law.—The following amendment to the constitution was submitted by the legislature at the session of 1877 and adopted by the people at the general election held November 2, 1880: "The manufacture and sale of intoxicating liquors shall be forever prohibited in this State, except for medical, scientific, and mechanical purposes." Following Mrs. Nation's (see NATION, CARRIE) hatchet warfare on the Kansas saloons, the legislature, in 1901, endeavored to make more stringent regulations regarding the suppression of saloons, although the existing regulations were by no means mild. However, further sections were added, providing (1) that if appeal were taken from the decision of a court declaring that the saloon-keeper's liquors and paraphernalia were forfeit to the State because he had kept a "common nuisance," contrary to the law, then the appealing party must file a bond as surety that the appeal would be taken promptly; (2) that leases were to be void when entered into to maintain a "nuisance," and that (3) in all prosecutions it should be *prima facie* evidence against the accused if he should be found to have fitted up a bar and to have therein a United States internal revenue tax stamp. County attorneys were also authorized and directed, in case they suspected a violation of the law, to subpoena any persons whom they believed might have information on the subject, and to examine them under oath.

Other Laws.—A commission of five was appointed to supervise the Kansas exhibit at the St. Louis Fair in 1903, and \$75,000 was appropriated for purposes of the exposition. An act was passed appropriating \$10,000 to be used for the year ending June 30, 1902, in paying a bounty of \$1 a ton on the production of beets for the manufacture of beet sugar. Train robbery was made punishable by imprisonment for life or for not less than ten years. The sale of morphine, cocaine, and chloral, except upon the prescription of a physician, was prohibited. An act was passed to enable counties, townships, and cities to purchase and use automatic ballot or voting machines at all general or primary elections. Railroad employees required by their duties to be absent from their voting precincts on the day of any general election were authorized to cast their votes wherever in the State they might be. An act was passed to regulate the use of natural gas and to prevent its waste. By this law no person owning or controlling a natural-gas or oil well was to be permitted

to use the gas by direct well pressure either for pumping or blowing oil out of wells or to operate machinery; nor was he to be permitted to allow oil or gas to escape, but was directed to confine it in tanks and pipes; natural gas was not to be used hereafter to light streets in "flambeau" lights (which are wasteful); nor allowed to be set on fire. An act was passed authorizing the formation of companies for the purpose of protecting and insuring farmers from damages to their crops occurring from hailstorms. An act for the regulation of prosecutions for libel enacted that if in any trial it should be brought out that the libelous utterances were published in good faith, and that full retraction had been made so soon as the editor or publisher understood the falsity of his statements, then the plaintiff might only recover actual damages; but this partial exemption was not to apply if the libel concerned any candidate for office, "unless the retraction was made editorially, in a conspicuous manner, at least ten days before election;" and it was not to apply at all in case of a libel concerning a woman. An act was passed providing for the appointment of tax commissioners to report by January 1, 1902, on the needed revision of the tax laws, which were declared to be at present cumbersome, unequitable, and injurious to the interests and violative of the rights of the people. The commission was to consist of five members of the legislature, the State treasurer, auditor of the State, and the attorney-general. A proposed amendment to the constitution provides that the salaries of the legislators shall be raised from \$150 to \$500 for regular, and from \$90 to \$150 for special sessions. Another proposed amendment provides that township elections, instead of being held in April, shall hereafter be held conjointly with the general elections on the first Tuesday succeeding the first Monday in November. A joint resolution states that whereas it is a matter of common notoriety that the waters of the Arkansas River are being diverted from their natural channel by the State of Colorado, to the great damage of the State of Kansas, the attorney-general is directed to institute legal proceedings to protect the rights of Kansas. For Colorado's attitude on this subject, see article COLORADO.

State Officers.—Holding office in 1901 and through 1902: Governor, W. E. Stanley, Republican, elected for two years, term ends in January, 1903; lieutenant-governor, H. E. Richter; secretary of state, George A. Clark; auditor, George E. Cole; treasurer, Frank E. Grimes; attorney-general, A. A. Godard; superintendent of education, Frank Nelson; commissioner of agriculture, F. D. Coburn; superintendent of insurance, W. V. Church. Chief justice, term six years, expires January, 1903. Frank Doster; associate justices, William A. Johnston, William R. Smith, Edwin W. Cunningham, Adrian L. Greene, Abram H. Ellis, and John C. Pollock.

Congressional Representatives (57th Congress).—In the House: C. F. Scott, from Iola, elected at large; Charles Curtis, from Topeka; Justin D. Bowerstock, from Lawrence; A. M. Jackson, from Winfield; James M. Miller, from Council Grove; William A. Calderhead, from Marysville; William A. Reeder, from Logan; and Chester I. Long, from Medicine Lodge—all Republicans except A. M. Jackson, Fusionist. In the Senate—J. R. Burton (until 1907), Republican, from Abilene, and William A. Harris (until 1903), from Linwood, elected as a Populist, but latterly acting with the Democratic party.

KANSAS, UNIVERSITY OF, at Lawrence, Kan., founded 1866, is an integral part of the free public-school system of the State. During 1900-01 the faculty consisted of 74 professors and instructors, and the student body numbered 1,154, excluding duplicate names, distributed as follows: Graduates, 82; school of arts, 585; law, 133; pharmacy, 78; engineering, 166; fine arts, 110; medicine, 47. The number of men was 738, that of women 416. The library contains 35,237 volumes and a large number of pamphlets. An annual appropriation of \$5,000 is devoted to the purchase of books. In September, 1904, new requirements for admission will go into effect, though 119 high schools and colleges throughout the State are qualified to send their graduates to the university without entrance examinations. There are 5 teaching fellowships. The museums of natural history offer special opportunities. The work in botany, entomology, zoology, and geology is greatly aided by a cabinet collection of more than 200,000 specimens. The herbarium includes upwards of 5,000 species of plants, and the collection of large mammals indigenous to the North American continent is one of the most complete in the world.

KATSURA, General Viscount TARO, who became premier of Japan to succeed Marquis Ito, organized the present ministry in May, 1901. General Katsura was born in the province of Nagato in 1849, and as early as 1867 he made a brilliant military reputation in the fighting connected with the Restoration. Some years later he was sent by his government to Germany to study military details, and again, in 1876, as a colonel of the Japanese army, he made another visit of inspection. On his return to Japan he was made major-general, and was appointed vice-minister of war under General Oyama, and it was largely through his influence that the army

was reorganized and reformed. In 1891 he was promoted to lieutenant-general, and during the war with China he performed brilliant service. He was created viscount for his services, and in 1897 attaining the rank of general, assumed the duties of minister of war a year later, holding this office until the downfall of the Yamagata cabinet in October, 1900.

KELLOGG, ELIJAH, American author and clergyman, died at Harpswell, Me., March 17, 1901. He was born at Portland, Me., May 20, 1813, and graduated at Bowdoin College in 1830. In 1843 he graduated at the Andover Theological Seminary, and was immediately installed in the Congregational church at Harpswell, of which he remained pastor for the remainder of his life, with the exception of ten years, 1855-65, when he was chaplain of the Seaman's Friend Society of Boston. He became famous as the author of numerous books for boys, which were known as *The Elm Island Series*; *The Good Old Times Series*; *The Forest Glen Series*, etc., and of recitations, two of which, *Spartacus to the Gladiators* and *Regulus to the Carthaginians*, have long been favorite pieces for declamation in the schools.

KENNEDY, GEORGE N., former justice of the New York Supreme Court, died at Thousand Island Park, N. Y., September 7, 1901. He was born in New York, September 11, 1822, and was admitted to the bar in 1842. He was one of the organizers of the Republican party, and was a member of the Free-soil convention of 1848 that nominated Martin Van Buren for President. From 1863 to 1865 he served in the New York State Senate, and in 1882 he was elected to the bench of the Supreme Court, being retired by the age limit in 1893.

KENTUCKY, an east central State of the United States, has an area of 40,400 square miles. Kentucky was admitted to the Union June 1, 1792. The capital is Frankfort. The population in 1900 was 2,147,174, while in June, 1901, as estimated by the government actuary, it was 2,179,000. The populations of the four largest cities in 1900 were: Louisville, 204,731; Covington, 42,938; Newport, 28,301; and Lexington, 26,369.

Industries.—Although Kentucky is an agricultural State, the census reports of 1900 indicate a large growth in mechanical industries since 1850. In that time the population has increased from 982,405 to 2,147,174, or 118.6 per cent., while the average number of industrial wage-earners has increased from 21,476 to 62,962, or 193.2 per cent., embracing in 1900 2.9 per cent. of the entire population. In the latter year the amount of actual capital, exclusive of capital stock, invested in 9,560 establishments reporting was \$104,070,791; the gross value of the products, \$154,605,115; while the net value, exclusive of products re-used in the process of manufacture, was \$108,619,199. The manufactures of Kentucky depend, first, upon her natural resources—tobacco, corn and wheat fields, hardwood forests, coal and iron mines, and water power—and secondly, upon the shipping facilities afforded by two rivers—the Ohio upon the northern border and the Mississippi upon the western border—which furnish access to the great river system of the central valley of the United States, and by railroads. Owing to these means of communication with the largest tobacco-growing section of the country, Louisville has been for many years a leading leaf-tobacco market of the world, and its great facilities as a distributing point have made it the centre of this as well as of the brewing industry. The manufacture of tobacco is the most important industry in the State, with a product in 1900 valued at \$21,922,111, or 14.2 per cent. of the total value of the products of the State, an increase since 1890 of 93.6 per cent. Next in importance are flouring and grist mill products, the output in 1900 being valued at \$14,515,161, an increase since 1890 of 49.9 per cent. Mills were early established on all the streams of the State; but only during the last decade has attention been paid to export trade, which is now of considerable proportions. A large industry is the making of malt and distilled liquors, with an output in 1900 valued at \$12,973,154, a decrease of 27 per cent. since 1890. The product is almost wholly corn whiskey. Other industries of importance are the manufacture of iron and steel, with a product valued in 1900 at \$6,876,093; the slaughtering and meat-packing industry, with a product valued at \$5,717,617; the manufacture of foundry and machine-shop products, with a product valued at \$4,434,610; car construction, and general shop work, with a product valued at \$4,248,029; the tanning, currying, and finishing of leather, with a product valued at \$3,757,016; and the manufacture of men's clothing, with a product valued at \$3,420,365. There are two extensive coal fields and large deposits of iron ore in this State; but the lack of transportation facilities up to a recent date has delayed the development of these.

Forests and Forest Products.—Large areas in this State are still covered with forests of hardwood. Logging is an extensive industry on the upper waters of the Cumberland, Kentucky, and Licking rivers, where large sawmills are also located. The manufacture of lumber and timber products ranks third among the industries of the State, the product in 1900 being valued at \$13,774,911, an increase since 1890

of 74.3 per cent. The presence of the chestnut-oak tree, the bark of which furnishes the tannin needed in the manufacture of leather, has favored the growth of the latter industry in Kentucky.

Goebel Murder Trials.—On January 30, 1900, State Senator William E. Goebel, Democratic contestant for governor of Kentucky, was shot in front of the capitol building at Frankfort, and died on February 3. There were accused as being his murderers, directly or as accessories before the fact, Caleb Powers, Republican secretary of state; James Howard, and others. On September 26 James Howard was found guilty of having fired the fatal shot and was sentenced to be hanged; on August 18 Caleb Powers was convicted as an accessory and was sentenced to life imprisonment. An appeal was promptly taken to the Court of Appeals, which on March 27 granted new trials to both men. In the case of Howard the decision for a new trial was unanimous, while in that of Powers the opinion was divided on political lines. In September, 1901, Powers was reindicted by a grand jury meeting at Frankfort. In accordance with the indictment he was tried in October, before a jury made up entirely of Democrats and presided over by Judge Cantrill, a Democratic candidate, as was alleged, for the United States Senate. The attorneys for the defense filed an affidavit alleging that both court and jury were partisan and should be disqualified under the rules of common law. The objections, however, were overruled by the judge, and on October 26 Powers was again sentenced to imprisonment for life, and notice was given by the defense that the case would be taken to the Court of Appeals. In April Garnett Ripley was tried on a charge of being accessory to Goebel's murder. He was acquitted, however. In November Governor Durbin, of Indiana, refused to honor the requisition of Governor Beckham, of Kentucky, for the return to the latter State of W. S. Taylor, the ex-governor of Kentucky, and of Charles Finley, ex-secretary of state. The governor of Indiana said, as had his predecessor, Governor Mount, the year before, in reply to a similar requisition, that conditions in Kentucky were not such as to warrant him in believing that the men, if returned, would receive a fair trial.

Elections.—At the elections held in Kentucky on November 5 for members of the legislature, the Democratic ticket won by about 20,000 majority, as against an 8,000 Democratic majority in 1900. The legislature, which meets in January, 1902, will have as a principal duty the election of a successor to United States Senator W. J. Deboe (Republican). As shown by the official count, the Democrats will have a majority of 60 on a joint ballot in the general assembly. In the House there will be 73 Democrats and 27 Republicans, and in the Senate 26 Democrats and 12 Republicans. Under the new constitution this new legislature will also redistrict the State for State and congressional representatives, and in view of the bitter partisan contest in Kentucky in the last two years, there is stated to be little doubt but that the Democrats will take full advantage of their victory at the polls.

State Officers.—Governor, J. C. W. Beckham, Democrat, elected to fill the place made vacant by the death of Governor Goebel, term expires December, 1903; lieutenant-governor, L. H. Carter; secretary of State, C. B. Hill; auditor, Gus. G. Coulter; treasurer, S. W. Hager; attorney-general, R. J. Breckinridge; superintendent of education, H. V. McChesney; commissioner of agriculture, I. B. Noll; commissioner of insurance, J. B. Chenault. **Judiciary.**—Court of Appeals: Chief justice in 1901, Thomas H. Paynter, Democrat, and in 1902, B. L. D. Guffy, Republican; associate justices, J. D. White, Democrat; George Du Relle, Republican; A. Rollins Burnam, Republican; J. B. Hobson, Democrat; Edward C. O'Rear, Republican; and B. L. D. Guffy (in 1901) and Thomas H. Paynter (in 1902).

Congressional Representatives (57th Congress).—In the House: Charles K. Wheeler, of Paducah; Henry D. Allen, of Morganfield; John S. Rhea, of Russellville; David H. Smith, of Hodgenville; Henry S. Irwin, of Louisville; D. Linn Gooch, of Covington; South Trimble, of Frankfort; George G. Gilbert, of Shelbyville; James N. Kehoe, of Marysville; J. B. White, of Irvine; and Vincent Boreing, of London—all Democrats except H. S. Irwin and Vincent Boreing, Republicans. In the Senate: William J. Deboe (until 1903), Republican, of Marion, and J. C. S. Blackburn (until 1907), Democrat, of Versailles.

KERR, ORPHEUS C., pseudonym of Robert Henry Newell (*q.v.*).

KHIVA. See TURKISTAN, RUSSIAN.

KING, CLARENCE, first director of the United States Geological Survey, died at Phoenix, Ariz., December 24, 1901. He was born at Newport, R. I., January 6, 1842, and was educated at Hartford, Conn., and at the Sheffield Scientific School of Yale College, graduating from that institution in 1862. In the following year, while making a trip across the continent in company with an emigrant train, he made observations which led to his subsequent suggestion that the geological features of the vast western region should be examined thoroughly, and as a result a government party under King's direction made an extended exploration of

the territory. After reaching California King became connected with the Geological Survey of that State, under Professor J. D. Whitney, and made extensive explorations of the mountains of the Sierra Nevada range, climbing and measuring some of the highest peaks. In the winter of 1866-67 he demonstrated to the government the desirability of a geological exploration of the fortieth parallel of latitude, and for this purpose an expedition was organized under his direction. It investigated the fortieth parallel between the eastern slope of the Rocky Mountains and the western slope of the Sierra Nevada, taking several years for the work. Mr. King came before the public prominently in 1872, through his exposure of the salted diamond fields of Arizona, one of the greatest swindles ever attempted. The United States Geological Survey may be said to have taken its origin from his geological and topographical work in the West, and King was appointed first director, serving from 1878 to 1881. He then retired to devote his attention to private interests, and became a consulting mining engineer, in which capacity he enjoyed the highest reputation. He supervised the collection of the statistics of precious metals for the tenth census, from which developed the valuable statistical work since carried on by the Geological Survey. He wrote much, his contributions appearing in geological and other scientific journals and in reports of expeditions. Some of his works are: *Mining Industry* (with Hague, 1870); *Mountaineering in the Sierra Nevadas* (1871); *Systematic Geology* (1878); *Report on Physical Constants of Rocks* (1883); and *The Age of the Earth* (1893). He was a member of the National Academy of Sciences and many other learned societies.

KING'S DAUGHTERS AND SONS, INTERNATIONAL ORDER OF THE, was founded in New York City in 1886 and was incorporated in 1889. It "recognizes no dividing lines of race, creed, or social conditions," the object of the order being service *In His Name*, the guiding motto. Its adherents are distributed over most of the known world, and according to latest reports have attained to an approximate membership of 700,000. The primary unit of organization in the order is the circle, which varies considerably in size; there are also chapters and city unions, State and county branches, and national branches in foreign countries. President, Mrs. F. Bottome; secretary, Mrs. Isabella C. Davis, 156 Fifth Avenue, New York City.

KIPLING, RUDYARD. See LITERATURE, AMERICAN AND ENGLISH.

KITCHENER, General Lord HORATIO HERBERT. See TRANSVAAL.

KNIGHTS OF LABOR, organized in 1869, the general assembly being formed at Reading, Pa., in 1878, is a national organization having for its object the furtherance of the cause of labor and the adjustment of questions arising between organized labor and capital. The organization claims a membership of more than 200,000 in the United States and Canada. The next annual general assembly will be held at Niagara Falls, Ont. General master workman, Henry A. Hicks, Kearney, N. J.; general secretary-treasurer, John W. Hayes, 43 B Street, Washington, D. C.

KNIPE, JOSEPH FARMER, brigadier-general, U. S. V., died at Harrisburg, Pa., August 18, 1901. He was born at Mount Joy, Pa., November 30, 1832, and was educated at a private school. He served throughout the Mexican War, and at its close engaged in business at Harrisburg. In 1861 he organized the Forty-sixth Pennsylvania regiment, being commissioned its colonel, and in 1862 he was made a brigadier-general of volunteers. At the fall of Atlanta he was in command of a division; then he became chief of cavalry in the Army of the Tennessee; was wounded twice at Winchester, twice at Cedar Mountain, and once at Resaca. During President Johnson's administration General Knipe was postmaster of Harrisburg, and later he was superintendent of one of the departments of the Fort Leavenworth military prison.

KNOX, PHILANDER CHASE, who succeeded John W. Griggs (*q.v.*) as attorney-general of the United States on April 5, 1901, was born at Pittsburg, Pa., in 1852. He graduated at Mt. Union College, at Alliance, O., in 1872, and three years later was admitted to the bar, after studying in the office of a Pittsburg lawyer. With the exception of one year, during which he was assistant United States district-attorney, Mr. Knox was in active practice in Pittsburg, in charge of the legal business of many large corporations, until he was selected by President McKinley to become attorney-general. He is a prominent member of the Pennsylvania Bar Association, being president of that body in 1897, and is considered one of the foremost authorities on corporation law.

KOCH, ROBERT. See TUBERCULOSIS.

KOENIG, RUDOLPH, physicist, instrument-maker, and an authority on all matters connected with acoustics, died in Paris, October 2, 1901. He was born in 1832, in Koenigsburg, Prussia, where he studied at the gymnasium. When 19 years of age he went to Paris and became an assistant in the workshop of Vuillaume, the

violin maker, where he was successful, both on account of his skill as a mechanic and his delicate and correct ear. While engaged in such labors he occupied himself with the study of physics and mechanics, and by 1859 had established himself as a manufacturer of acoustic apparatus. His appliances, some of which were devised by himself, soon achieved a high reputation which was always maintained, his tuning-forks and other instruments having been accepted as standard by physicists the world over. In 1868 he received the honorary degree of Doctor of Philosophy from the University of Königsberg. He was the author of *Quelques Expériences d'Acoustique*, and papers on acoustics in Poggendorff's and Wiedemann's *Annalen*.

KOWEYT. See ARABIA.

KRAUS, ADOLPH F., sculptor, died at Danvers, Mass., November 7, 1901. He was born in Prussia in 1850, and during his study of art won the Grand Prize of Rome. Before coming to the United States in 1881, he had become a pensioner of the Prussian government, and had an established reputation in the art world. Among the well-known commissions Mr. Kraus executed in America were the statue of Theodore Parker, the Crispus Attucks monument in Boston, and the winged figures of Victory crowning the towers of Machinery Hall at the Chicago World's Fair of 1893.

KRUGER, STEPHANUS JOHANNES PAULUS, the last president of the South African Republic, after trying vainly to enlist the help of the governments of France and Germany in the cause of Boer independence, went to Holland at the end of 1900, and remained there throughout 1901. Queen Wilhelmina and the government of Holland received Mr. Kruger with honor, and various efforts were made during the year to bring the representatives of the British government and Mr. Kruger together with a view to arranging a basis of settlement of the South African War. He had no active share in the direction of the Boer organization during 1901, having delegated whatever authority remained to him to President Steyn, of the Orange Free State. Mr. Kruger was born in Rastenburg, Cape Colony, October 10, 1825.

KUBELIK, JOHANN (JAN), the young Bohemian violinist, whose tour through the United States in the latter part of 1901 was highly successful, was born at Miehle, near Prague, in 1880. His first musical instruction was received from his father, a market gardener; and when he was twelve years old he entered the Prague Conservatory, where his talent and assiduous study won favorable notice. In 1900 he appeared in Berlin with the Philharmonic orchestra, and in June of the same year he made his début in London in a concerto by Paganini. The technical difficulties of this composer he surmounted with the greatest ease, and as a technician he was hailed as a genius. He appeared in New York City in November, in the first of a series of forty concerts arranged in the United States.

KUYPER, ABRAHAM, Dutch publicist, was chosen prime minister of the Netherlands after the elections of 1901. He was born at Maasslins, Holland, October 29, 1837. After studying at the gymnasium at Leyden, where his father was pastor, he entered the university there, where he studied theology. He first attracted notice by winning the prize offered by the University of Groningen for an essay upon the times of Calvin and John à Lasco. In 1863 he was ordained as a clergyman of the Reformed Church at Beesa, where he remained four years. He was called to Amsterdam in 1869, and soon became interested in politics, being elected in 1873 to a seat in the second chamber. In 1877 he resigned his membership in the chamber and devoted himself to the founding of the Free University at Amsterdam, of which he became the first rector. At the same time Dr. Kuyper edited the *Standard* and *De Heraut*, two papers which were influential in building up a party that came into power in 1888. But in 1891 the Liberals returned to power, the party headed by Dr. Kuyper having split upon the question of the right of suffrage (*Kiesrecht*). From that time until 1897, when he was returned to the chamber once more, he devoted himself to social and religious work, organizing in 1891 the social congress held that year in Holland, and from 1892 to 1896 working to secure the cooperation of the two branches of the Dutch Reformed Church. In 1898 Dr. Kuyper came to the United States to lecture at Princeton University, where the degree of Ph.D. was conferred upon him.

KYLE, JAMES HENDERSON, United States senator from South Dakota, died at Aberdeen, in that State, July 1, 1901. He was born near Xenia, O., February 24, 1854, and was educated in the schools of Urbana, Illinois State University, and Oberlin College, graduating from the last-named institution in 1878. After studying law for a time, Mr. Kyle prepared for the ministry at the Western Theological Seminary of Pennsylvania, and upon graduation in 1872 was ordained. In 1890, after he had filled various pulpits in Utah and South Dakota, he was chosen a State

senator, and in the following year was sent to the federal Senate. He was re-elected in 1897, and served until his death as chairman of the Senate Industrial Commission. He was elected to the Senate as an Independent, but usually acted with the Republican portion of the body.

LABOR. The question of child labor in the South was vigorously discussed during 1901. New England cotton manufacturers, who conduct their business under laws which limit the employment of children, have for some years past been active in protesting against the larger employment of children in the cotton mills of the South, where the laws permit child labor. Their motive in agitating for more stringent child labor laws in the southern States is quite as much business as humanitarianism. It is claimed that the southern mills, which enjoy a natural advantage in their cheap cotton, add to this the unfair gain from the employment of young children. The southern mill owners on their part contend that they are doing everything in their power to improve the condition of their operatives, and that the agitation for more stringent labor laws in the South is brought about by labor unions in New England, aided and abetted by New England manufacturers seeking to stifle southern enterprises. Leonora B. Ellis, in the *Independent* of November 7, 1901, presents the humanitarian view of southern child labor: "England began her fight on the giant evil a hundred years ago; and although the conflict lasted with varying issues for more than half a century, the good cause, under such leaders as the clear-sighted Earl of Shaftesbury, ultimately won a complete victory. Russia, France, Germany, Austria, and finally New England, went through the same phases of industrial development, met the same problem, and each, after painfully grappling with it for a shorter or longer period, solved it as England did, by entirely removing the child of tender age from the factory and restricting the hours and conditions of labor for all under sixteen years. But in the southern States no such righteous solution has been attained. Absorbed in the rapid development of her new dower of wealth, the South is pushing on blindly, drawing to its uses every available tool, refusing to recognize any sacrifice when she consumes the powers and lives of little children for grossly material ends, obstinately forgetting that she can have no future except that founded upon the intelligence of her coming generations. With a pardonable arrogance we boast of South Carolina's mighty strides in cotton manufacturing, but we must admit with shame that 25 per cent. of her mill operatives working 60 hours per week are children under fourteen years of age. The proportion of juvenile workers is not so great in the other cotton States, the percentage of those under fourteen ranging from one-tenth to one-fifth of the entire body of operatives, yet that is far too great." On the other side, the cotton manufacturers are able to make out a plausible case in their own defense. At a meeting on September 10, 1901, at Greenville, S. C., of the textile manufacturers of the State, a committee of five was appointed to prepare a statement for the legislature showing the conditions in mill villages and explaining what the corporations have done for the advancement and education of their children. An extract from this report presents the attitude of the southern manufacturer on the subject of child labor. "No one can deny the unfortunate result of the employment of children of tender years in labor of any kind. Such employment is, nevertheless, often a necessary result of poverty. The agricultural interests of the State have not afforded to the tenant classes a living revenue. The result is that they are in many sections in an impoverished condition, and have sought the mills as a means of obtaining a better living. Coming to the mills without resources, and yet unskilled in mill labor, these people are often for a time forced to put into employment the children whom they had previously been accustomed to work on their farms. The mills generally have recognized the evil tendency of child labor. They try to and do discourage the employment of such children. They have established and support schools for many months in the year at a very considerable expense to themselves, and encourage the attendance of children in these schools. They have aided in the establishment or have established and maintained churches and Sunday schools, as also libraries and places of entertainment and amusement. But whilst making efforts to improve the condition of the mill population, the management of the mill properties, being in a position to be conversant with the facts attending individual families, know that in many cases the employment of children of a younger age than would otherwise be desired is necessary. The results of arbitrary legislation would be felt not so much by the older established mills as by the newly established, and not so much even by these latter as by that portion of our population, who from distress and misfortune have been forced to seek mill life, and are not yet prepared to support themselves without the labor of their children." In this connection the rules recently adopted by the Georgia Industrial Association, and which are now in force in every cotton mill in that State, are of interest: (1) One week's work shall not exceed 66 hours; (2) no child under 12 years of age shall be allowed to work at night, and no child under 10 years shall be allowed to work in any circumstances; (3) between the ages of

10 and 12 years a child may work in daytime only under one of the following conditions: (a) Such child must be able to read and write; (b) the child of a widow or physically disabled parents who are dependent upon the labor of such child for support; (c) after such child has attended school for four months during such calendar year.

Increasing attention is being paid to the subject of technical education for workingmen. The most considerable effort in this direction during 1901 was the establishment by Mr. Andrew Carnegie (*q.v.*) of a school of technology to be located at Pittsburg. The plan contemplates the establishment of three grades of schools. The first will be called the Carnegie Technical College, which will provide a technical education to high school graduates, teaching engineering in all its branches. The second will be called the Carnegie Technical High School, and will be for the benefit of graduates of the grammar schools; in addition to the regular high school studies it will provide instruction in blast furnace and foundry practice, brass founding, metal working, and other departments particularly adapted to the needs of the Pittsburg district. The third school will be the Carnegie Artisan Day and Evening Classes and is intended for the benefit of those who are unable to take advantage of the more complete courses in the technical schools. The University of Wisconsin has also established a summer school of technical education for workingmen, to be held for six weeks during the summer. The first session of the school was held during the summer of 1901. The result of the experiment was that 28 persons, ranging in age from 15 to 55, received letters from the University attesting the completion of one term's work. The following occupations were represented: Professor, teacher, draftsman, inspector of railway motor-power, foreman, machinist, lineman, stationary engineer, and machine shop apprentice. It is expected that eventually the sessions of the school will become continuous, although the summer school, on account of the general practice of closing certain classes of mills during the hot weather, will probably secure the largest attendance. Many large industrial concerns are interesting themselves in the more thorough education of their apprentices. In the Brown & Sharpe works at Providence, R. I., for example, apprentices are regularly hired like any other employee. Applicants for membership must be between 16 and 18 years of age, must be physically sound, of good moral character, and must have a grammar school education. On fulfilling these conditions, the boy has a trial of 480 hours' service. If this proves satisfactory he begins a regular term of four years. The company selects the time when vacations may be taken. The boys are taught their trade carefully by overseers who watch and help them at their work. The wages paid are six cents an hour during the first year, eight cents during the second, ten cents during the third, and fourteen cents during the fourth; but the company reserves the right to terminate the contract at any time for neglect of rules, laziness, or incapacity, in which case six cents per hour is paid for the time of service. Most of those who take the course go into the service of the company.

Efforts toward industrial peace are frequently directed toward profit sharing. In some cases, as, for example, the Proctor & Gamble Company, manufacturers of "Ivory Soap," these efforts have been successful; but as yet the practice of profit sharing is generally regarded as utopian and unpractical. A more feasible method, which seems not only to admit the employees of a company to share in its profits, but also and primarily to identify themselves with its interests, is found in the plan of admitting them as stockholders, either in return for services rendered, which is the method for many years adopted by the Carnegie Company, all of whose principal stockholders were at some time numbered among its employees, or by selling stock to employees on special terms. The *World's Work* for October, 1901, gives several examples of this method: "The system by which the Illinois Central Railroad enables its workmen to secure a part of its earnings operates as a sort of savings-bank for the men. On the first day of each month the market value of the shares of the road is registered at the price at which they will be sold to the men during that month, regardless of any fluctuations on the market. The men have the privilege of paying for their stock on the installment plan by making deposits of five dollars or more every month. Upon the deposit they receive four per cent. interest, with the right to withdraw the deposit when they choose to do so." The Great Northern Railroad has adopted a similar system. Of the stock of the road, \$1,000,000 is offered to the employees at par; but in order to prevent them from selling the stock, which stands at a high premium, it is held in escrow for the purchasers and only the dividends are paid to them. Many persons, among them Mr. James B. Dill and Mr. Abram S. Hewitt, see in this system a way to identify the interests of labor and capital. The *Iron Age*, however, in commenting upon the practice of offering stock to employees on favorable terms, makes the following pertinent observations: "For many reasons we think it a mistake to offer workmen any inducements to become stockholders of the companies employing them. To have them interested is often an advantage, but they should become so on precisely the same basis. Any-

thing which tends to encourage the feeling among wage-earners that they are a 'class' apart, and as such are entitled to be looked after and patronized by another class, is mischievous. It starts with a false assumption. In this country the wage-earner represents not a class, but a condition—as temporary as he may choose to make it. The conditions of emancipation from wage service are industry, self-improvement, and the homely virtues of economy and thrift. We find very few employers who have not at some stage of their careers been wage-earners—not in an amateur way, but because no other means of starting in life was open to them. For this reason it is misleading and mischievous to talk or think of such impossible abstractions as a 'working class,' a 'laboring class,' or a 'wage-earning class.' See **ARBITRATION, LABOR; FEDERATION OF LABOR, AMERICAN; INDUSTRIAL COMMISSION; PENSIONS FOR WORKINGMEN; STRIKES; TRADE UNIONS; UNION LABEL.**

LABOR, AMERICAN FEDERATION OF. See **FEDERATION OF LABOR, AMERICAN.**

LACAZE-DUTHIERS, FELIX JOSEPH HENRY, Baron de, French zoologist, died July 21, 1901. He was born May 15, 1821, at Montpezat (Lot-et-Garonne), France, and after studying medicine in Paris, devoted himself to zoology, being appointed professor of zoology in the University of Lille in 1854. He became *maître de conférences* at the Ecole Normale in 1864, professor of zoology at the Paris Museum of Natural History in 1865, and in 1871 was appointed professor of zoology at the Sorbonne. For many years he was a member of the Paris Academy of Sciences and at one time its president. Among his researches may be mentioned a study of the corals of the French coast undertaken for the government of France, which resulted in a *Monographie du Corail*. Professor Lacaze-Duthiers established the biological stations at Roscoff in Brittany and Banyul-sur-mer on the Mediterranean Sea, which have furnished opportunities for research to Americans and Europeans alike. He was the author of *Histoire Naturelle du Corail* (1863); *Histoire de l'Organisation et du Développement des Mœurs du Dentale* (1854); and *Le Monde de la Mer et ses Laboratoires* (1873). In 1889 he established the *Archives de la Zoologie Expérimentale*.

LACROSSE. In the international lacrosse contest at Buffalo, N. Y., the Crescent Athletic Club beat the Seneca Indians 4 to 2, and the Capitals, of Ottawa, beat the Toronto team 3 to 2. The finals ended in a close contest, Ottawa winning. In the intercollegiate lacrosse contests the University of Pennsylvania beat Columbia 4 to 3, Cornell beat University of Pennsylvania 3 to 1, and Harvard beat Cornell 6 to 0. In the United States the most prominent independent teams in 1901 were Johns Hopkins, Swarthmore, Stevens Institute, and the Crescents.

LADRONES, or MARIANNE ISLANDS, a group of islands in the Pacific north of German New Guinea and about 800 miles east of the Philippines. They belong to Germany, except Guam (*q. v.*), by cession from Spain in 1899. They have an area estimated at 400 square miles and a population of about 10,000, of a race allied to the Tagals of the Philippines. The islands are volcanic and infertile. The capital of the group is Saipan. They are governed as a part of the German New Guinea protectorate. They are commercially unimportant, but may become valuable for naval purposes.

LAFLIN, BYRON, brevet major-general, U. S. V., and reconstruction governor of North Carolina, died at Hudson, N. Y., June 20, 1901. He was born at Lee, Mass., in 1829, and before the Civil War was a paper manufacturer at Herkimer, N. Y. He served in the Union army, was made captain of volunteers, then colonel, and later brevetted major-general. At the close of the war General Laflin was made provisional governor of North Carolina, and also served in the legislature of that State.

LAGOS, a British crown colony of West Africa lying between Dahomey and Southern Nigeria, has an area of 985 square miles and a population of over 85,000. The town of Lagos, with about 40,000 inhabitants, is the largest on the West African coast. Beyond the colony proper is the British protectorate of Lagos, which has an estimated area of some 21,000 square miles and about 3,000,000 inhabitants. Within this territory are a number of large cities, Ibadan and Abeokuta having, it is said, about 180,000 and 150,000 inhabitants respectively. The colony is administered by a governor (Sir William MacGregor since 1899). Revenue, which accrues largely from customs, and expenditure in 1899 amounted to £192,792 and £223,289 respectively. In the same year the imports were valued at £960,797, of which £832,141 came from Great Britain and her colonies; the exports reached a value of £915,934, the leading items being palm kernels, £412,817; palm oil, £168,457, and rubber, £160,315. Though there is not sufficient labor for gathering the natural supplies of palm oil and palm kernels, there has been an alarming adulteration of the latter; this, however, is now checked by inspection. Efforts are being made to improve the rubber industry and prevent the destruction and wasteful tapping of trees. An official report published in 1901 noted the steady progress of the colony and pro-

tectorate, "owing to the cessation of troubles in the hinterland." A railway from Abeokuta to Ibadan (66 miles) was opened on March 5, 1901; this line is an extension of the Lagos-Abeokuta railway (60 miles). On December 13, 1901, a branch line from Abeokuta to Aro was opened. Native opinion favors railway construction.

LANDS, PUBLIC. The business of the United States General Land Office during the fiscal year ending June 30, 1901, was unusually large. Nearly 10,000 more final homestead entries, covering 1,180,520 more acres, were registered than during any other year since the passage of the Homestead Act in 1862, and about 7,400 more original homestead entries, covering over 1,000,000 more acres, were passed than during the preceding year. Of the amount of land disposed of during the year, the total was more than 2,100,000 acres greater than in the previous year, while the cash receipts from all sources, aggregating about \$5,000,000, exceeded those of 1899-1900 by nearly \$600,000. On June 1, 1901, the acreage of the public domain, including Alaska and excluding the new insular possessions, was 1,809,539,840 acres, of which 914,096,974 acres were undisposed of, 147,356,902 acres were reserved for various purposes, and 748,085,964 acres were appropriated, or embraced in selections, filings, and entries, and in school grants. All public lands, before being disposed of, i.e., before title passes, must be surveyed. On June 1, 1901, of the above-mentioned 914,096,974 acres undisposed of, 312,177,366 had been surveyed. During the fiscal year the area covered by accepted surveys was 8,810,837 acres, at a cost of \$325,000, the largest areas surveyed being in North Dakota, Montana, Idaho, South Dakota, Oregon, Arizona, and Utah, and the smallest in Florida and Alaska. The total amount of land disposed of during the year was 15,562,796 acres, an increase of 2,108,908 acres. Of this land, 1,301,669 represented cash sales, 109,347 Indian lands, and 14,151,780 acres miscellaneous entries, such as original homestead entries, state, railroad, and wagon-road selections, Indian allotments, swamp-land patents, etc. Of these 14,000,000 odd acres of miscellaneous entries, 9,479,275 acres were original homestead entries, an increase over the important preceding year of 7,378 entries and 1,018,866 acres. During the year, patents of the class denominated agricultural were issued to the number of 42,237, containing approximately 6,757,920 acres, an increase of 12,689 patents and 2,030,240 acres. There were 1,388 mineral and mill-site patents issued, aggregating an area of 50,852 acres, a decrease in the number of patents, but an increase of the area of mineral land patented by 8,500 acres, falling principally in Arizona, Arkansas, and Colorado. During the fiscal year the amount of land certified or patented on account of railroad grants was 2,470,805 acres, an increase of 1,193,232 acres; 165,547 acres, an increase of 104,046, were patented under the several grants to aid in the construction of wagon-roads. In addition to various rights of way granted for railroad, irrigation, and other purposes, lists were filed for reclaimed lands, under the state desert-land segregation law, by Idaho for 248,651 acres, and Wyoming for 82,617 acres; lists of 6,528 acres by Idaho and 77,199 acres by Wyoming were approved during the year, and a patent for 7,306 acres issued to Wyoming. In southern California the report of the United States land commissioners records that the suspensions of townships alleged to contain valuable oil deposits, from disposition under the agricultural laws, and the examination of the lands by a special agent, have allayed to a certain extent the excitement heretofore existing caused by the supposed appropriation of these lands by lien selectors or "scrippers." Relating to other States, an act extending the mining laws to saline lands was approved January 31, 1901. A large and important territory was thrown open to the people in the early part of the fiscal year 1901-02, as described in the article on OKLAHOMA.

Public Domain in the Insular Possessions.—With the acquisition of islands in the Pacific and the West Indies the United States has come into possession of large tracts of public lands of great value, but involving many perplexing problems. According to the report of the Taft commission, it has been impossible to obtain accurate data or information with reference to the public domain in the Philippines, and the same is true of Porto Rico. In Hawaii the conditions are more satisfactory. So far as the former Spanish possessions are concerned, no intelligent action can be taken looking either to the surveying or disposal of the public lands until sufficient reliable data have been furnished through some competent and trustworthy source. In Porto Rico the approximate extent of public domain is believed to be about 900,000 acres. An application for a survey of a part of these lands has already been made to the Interior Department; but at the present time that department has not been given jurisdiction over Porto Rican lands by Congress, and the general land office states that it is not aware of any law under which these lands can at present be either surveyed or sold. In the Philippine Islands the public domain is very large, some estimates placing it as high as one-half the area of the archipelago (See PHILIPPINES.) These public lands are largely in the more remote and inaccessible portions of the islands. They contain immense areas of valuable forests,

and mines of coal, iron, copper, gold, and other mineral deposits. According to the best authorities the Spanish mining laws must continue in force until modified by direct act of Congress, and this body decided in an act passed March 2, 1901, that no lease, sale, or other disposal shall be made of mining and other rights in the Philippines. The Taft commission has called upon the general land office to furnish the Philippine engineer officer with information as to the system of surveys now in use in the United States; but it is not known that any definite steps toward surveying the Philippine lands have as yet been taken. In Hawaii a definite system of surveys has been carried out. The island of Maui is divided by triangulation into 13 districts, which are subdivided and resubdivided. In several of the other islands some form of the rectangular system has been adopted. As the annexation act of 1898 provided that the United States laws relative to public lands should not apply to Hawaii, in 1900 it was enacted that the existing Hawaiian land act should continue in force. During the last session of Congress a bill was introduced to extend the United States general land laws to Hawaii, with rules and regulations for homestead entries. It is the opinion of the general land office that no intelligent recommendations can be made on this subject until a special commission shall be appointed, to collect data sufficient to enable the determination of the amount of the various classes of Hawaiian public lands yet unappropriated. See **FORESTRY**.

LAOS, an inland district of Indo-China, lying southwest of Tonquin, formerly belonged to the kingdom of Siam, but since 1893 has been a protectorate attached to the French colony of Indo-China. Its area is estimated at about 91,000 square miles and its population at about 1,500,000. Its capital is Luang Prabang, on the Mekong River, with a population of 40,000. The government is in the hands of a French resident, and the cost of administration is borne jointly by the other French Indo-Chinese dependencies. The local revenue and expenditure balanced in 1900 at 739,000 piastres. The principal products are rice, tobacco, indigo, cotton, and fruits. The commerce is undeveloped because of the difficulty of access to the region. See **INDO-CHINA**.

LATTER-DAY SAINTS. See **MORMONS**.

LAWN TENNIS. The disappointment of 1901 was the failure of the English team to put in an appearance for the contest for the Davis International Challenge Bowl. The year did not pass, however, without some international competition, owing to a visit to England of the American doubles-champions, Dwight Davis and Holcombe Ward, and one or two other American players. In the English championships, Ward and Davis won their way into the finals, where they fell before the Doherty brothers, 6-2, 4-6, 6-2, 9-7. The play of the Americans continued to interest the Englishmen, especially the twist service of Davis. Much interest was aroused by the opportunity to compare the widely contrasting styles of these American and British doubles-champion teams.

The usual American victory was scored in the annual United States-Canadian international tournament at Niagara-on-the-Lake, R. D. Little, of Princeton, again winning the singles championship, and Little and Alexander the doubles. In the twenty-first annual tournament of the United States National Lawn Tennis Association, held at Newport, during August 13-21, the championship in singles was won over fifty-seven competitors by William A. Larned, of Summit, N. J., winner of the all-comers' of 1900, three times runner-up, and for nearly a dozen years an aspirant for championship honors. Whitman, three-times champion, did not defend his title in 1901. Larned won every event in which he entered in 1901, except the New Jersey State tournament, where he defaulted to Richard Stevens. The first four rounds disposed of all the competitors but Larned and B. C. Wright. Larned won 6-2, 6-8, 6-4, 6-4, and M. D. Whitman, the champion of 1900, not appearing, Larned became the singles champion of 1901. In doubles, Ward and Davis captured the championship for the third successive year, and won the Championship Doubles Cup, which has been in competition since 1889. Their opponents were Ware and Wright, winners of eastern doubles, who had previously defeated the western doubles champions, Alexander and Little. In the woman's national tournament, held at Philadelphia in June, Miss Marion Jones, of California, won the singles, Miss Parker and Miss Champlin, of Chicago, the doubles, and Miss McAleer and Mr. Copten, of Philadelphia, the mixed event. Harvard won the intercollegiate championships—singles and doubles. The Eastern States championship was won by W. A. Larned; the Western by R. D. Little; the Middle by W. A. Larned; the Southern by R. D. Little; the Northeastern States by E. Hobart; the Pacific Coast by G. F. Whitney; the Northwestern by D. C. Snow; the Gulf Coast by R. G. Hunt. Various State championships were also played.

LAWSON, JOHN, railway engineer, died at St. Louis, Mo., November 20, 1901. He was born at Manchester, England, August 8, 1805, and while still a boy was apprenticed to George Stephenson, under whose direction he built the first successful

locomotive. Coming to the United States he served as engineer on various railroads, but abandoned this to go into the steamboat business, in which he was successful, and settled at Paducah, Ky., in 1845, when his boats first began to engage in the Cumberland River trade.

LEAD. The production of refined lead from domestic ores in the United States in 1900 amounted to 270,824 short tons, and showed a greater increase over the preceding year than has ever been known. It is not considered likely that a similar increase will be witnessed in 1901, and the total production is estimated at 265,000 short tons. The imports in 1900 amounted to \$702,213, as against \$216,434 in 1899. The world's production in 1900 was 826,070 metric tons, and the United States ranked first on the list of lead-producing countries.

LEARY, Captain RICHARD PHILLIPS, died at Chelsea, Mass., December 27, 1901. He was born at Baltimore, November 3, 1842, and left the Naval Academy in 1860, before completing his course, to join the blockading squadron off Charleston. From 1865 to 1868 he was on the European station, and after serving on a number of special assignments, he was made a commander in 1882, and attained the rank of captain in 1897. During the Samoan troubles of 1888 he won the title of "Fighting Dick" Leary, when his picturesque defiance of a German warship prevented the restoration of the Tamasese government. In 1899 Captain Leary was made governor of Guam, and conducted a vigorous administration of its affairs. In 1900 he was recalled, suffering from heart trouble, and was assigned to duty at the League Island Navy Yard. On the day before his death he was retired with the rank of rear-admiral.

LECITHIN, a collection of allied bodies, called lecithines, in physiological chemistry, composed of glycerine derivatives joined to cholin, phosphoric acid, and fatty acids. Lecithin exists in the tissues of brain and nerves, the yolk of the egg, bile, amniotic fluid, and some vegetables. It is insoluble in water, soluble in alcohol, chloroform, benzene, and some oils. It crystallizes from an alcoholic solution in plaque-like or acicular crystals. Lecithin has been used largely in 1901, with varying success, in tuberculosis. H. Claude and Almy, in the *Comptes Soc. de Biologie*, report arrest of loss of weight, and, later, actual gain in weight, in guinea pigs experimentally infected with tubercle. Huchard, in *Journal des Praticiens*, report increase of weight and decrease in loss of sugar in a patient suffering from diabetes and incipient tuberculosis. He administered 4-grain doses of lecithin 5 times a day for 6 weeks. In another case, that of a feeble, emaciated woman suffering with gastric ulcer of 6 months' duration, 4 grains of lecithin hypodermically every day for 15 days was followed by subsidence of vomiting, return of appetite, and a gain of 8 pounds in weight. In 27 days she was discharged from hospital. The remedy appears to modify nutrition favorably and to diminish the elimination of phosphorus. In many cases similar results are obtained from a diet of which eggs form a prominent part.

LE CONTE, JOSEPH, professor of geology and natural history in the University of California, died in Yosemite Valley, July 6, 1901. Of Huguenot ancestry, he was born in Liberty County, Ga., February 26, 1823, and was educated at the University of Georgia and at the College of Physicians and Surgeons in New York City, graduating from the latter institution in 1845. Previously, however, he had taken an active interest in scientific pursuits, and in 1844 he was a member of the first prospecting and exploring party to visit the rich mineral regions of Lake Superior. On this trip he explored not only the shores of the lake but the head-waters of the Mississippi and the northern part of Minnesota. After practicing medicine in Macon, Ga., for five years, Le Conte was drawn anew to the study of science, and for several years worked under Professor Agassiz at Harvard. In 1851, after receiving the degree of B.S. from Harvard he accepted the professorship of natural science in Oglethorpe University, Georgia, and in the following year became professor of geology and natural history in the University of Georgia. This chair he resigned in 1856 to accept a similar position in the University of South Carolina at Columbia, which he held until the Civil War. During this period he rendered valuable assistance to the Confederate government, serving as chemist to the government laboratory for the manufacture of medicines, and as chemist for the Nitre and Mining Bureau at Columbia, of which his brother, John, was the director. In 1868 he was called to the new University of California. Professor Le Conte's work as a geologist covered a broad range of subjects, and many important discoveries and critical papers resulted from his excursions and explorations. Among these were the study of the Cascade Mountains, in which their age, character, and relation to the great Columbia lava flood were determined, a description of the glaciers of the Sierra Nevada, and the study and classification of ore deposits. He has also made important contributions to the philosophy of geology, particularly as regards the structure and origin of the earth. His interesting book on *Sight* was the result of a series of papers on binocular vision published in various scientific journals, and showed

that he was at home in other branches of science than geology. He also published a number of papers on medical, chemical, and other scientific subjects, and in addition to his monographs in scientific journals and reports was well known for his *Elements of Geology*, first published in 1878. A more elementary presentation of the same subject followed in 1884, under the title of *Compend of Geology*. Professor Le Conte was a member of the National Academy of Sciences and numerous other learned societies, including the American Association for the Advancement of Science and the Geological Society of America, having served as president of the last two organizations. He was also a member of the editorial boards of *Science* and the *Journal of Geology*.

LEEWARD ISLANDS, so called from their location in relation to the trade-winds, constitute one of the colonies of Great Britain in the West Indies. They have a federal organization, to some extent representative, consisting of the five presidencies of Antigua (with Barbuda and Redonda); St. Christopher (St. Kitts) and Nevis (with Anguilla); Dominica; Montserrat; and the Virgin Islands, each of which retains its own local legislature. The total area of the colony is 701 square miles, and the population (1900), 140,576. The seat of government is St. John, on the island of Antigua. The government is vested in a governor (Sir Henry Moore Jackson), to whom the administrators and commissioners of the several presidencies are subordinate, and in a federal legislative council. The revenue in 1900 was £119,450, and the expenditure £131,973. The public debt amounts to £293,321. The total imports for 1900 were valued at £346,395, the largest since 1896, and the exports £279,020, a decline from £351,429 in 1899. Of the imports 40 per cent. came from Great Britain and 40 per cent. from the United States. The very considerable decline in exports was due, according to the colonial secretary, entirely to the decreased production of sugar, which ordinarily forms two-thirds of the exports, and which showed a falling off in 1900 of £72,000.

Antigua, the most populous of the Leeward Islands, has an area of 108 square miles, and in 1901 a population of 34,953. With it for administrative purposes are joined the islands of Barbuda and Redonda, the three forming a presidency of the Leeward Islands colony. St. John, its capital as well as the seat of the federal government, has a population (1901) of 9,262. Antigua has been a crown colony since 1898. The revenue in 1900 was £42,652, and the expenditure £49,435. There is a public debt of £137,071. Imports in 1900 were valued at £116,639, and exports at £105,580, a falling off of £23,000 since 1899. The island is very fertile, and the chief products are sugar (of which the export amounted to 24,572 tons in 1898-1900), and rum, molasses, and arrowroot.

Dominica, the largest of the British Leeward Islands, of which colony it forms a presidency, has an area of 291 square miles and a population (1901) of 29,000. Two-thirds of the inhabitants speak French. The chief town, Roseau, has a population of 6,000. The government has been, since 1898, that of a crown colony, being vested in an administrator and an appointive legislative council. In 1900 the revenue was £28,112, the greatest on record, and the expenditure £27,889. The imports for 1900 were £80,144, exceeding those of 1899 by £10,000. Dominica is the only one of the Leeward Islands showing an increase in exports, the figures being £65,766 for 1899 and £68,452 for 1900. The latter year was prosperous, the cultivation of sugar having been practically abandoned, and that of coffee, cacao, limes, and fruit increased.

Montserrat has an area of 32 square miles and a population (1901) of 12,215. Plymouth is its chief town (population, 1,461). The presidency is administered by a commissioner assisted by executive and legislative councils. The revenue amounted in 1900 to £18,394, and the expenditure £17,266. The public debt is £11,450. The imports, which remain nearly stationary from year to year, were £20,587 in 1900, but the exports, largely sugar, fell from £15,569 in 1899, to £8,287 in 1900.

St. Christopher, popularly called St. Kitts, together with Nevis and Anguilla, forming a presidency of the Leeward Islands colony, had a total population of 46,446 in 1901. St. Christopher (area 65 square miles, and population about 30,000) contains some of the most effectively cultivated sugar plantations in the West Indies. Nevis has an area of 50 square miles and 12,774 inhabitants, and Anguilla, 35 square miles and about 3,900 inhabitants. Basseterre (population, 9,962 in 1901), on the island of St. Christopher, is the seat of government of the presidency, which had a revenue (1900) of £39,904 and an expenditure of £42,832. The total imports were £136,435, and the exports, mostly sugar, limes, cacao, and coffee, were £159,834 in 1899, and £109,783 in 1900.

Virgin Islands, the name applied to the islands belonging to Great Britain, in the group of which the Danish West Indies form the principal part, constitute the most northerly presidency of the Leeward Islands colony. The three islands, Tortola, Virgin Gorda, and Anegada, have a combined area of 58 square miles, and a population (1901) of 4,908. The capital, Roadtown, on Tortola, had a population of 352. There is good pasturage, and cotton and sugar-cane are cultivated. The revenue

LELAND STANFORD, JUNIOR, UNIVERSITY.—The Inner Quadrangle (Upper). A Corner
of the Arcade (Lower).

and expenditure amounted in 1900 to £2,117 and £2,197 respectively, and the imports and exports to £3,320 and £2,812.

LELAND STANFORD, JUNIOR, UNIVERSITY, Palo Alto, Cal., founded in 1887; opened in 1891. Statistics for the academic year 1900-01, show a faculty of 136 and a student-body of 1,389, of whom 117 were in graduate standing. The figures for 1901-02 are about the same as for the previous year. There has been little change in the enrollment in the past four years. About \$20,000 were expended on the library in 1900-01, the collection now numbering about 75,000 volumes, including collected pamphlets. The university income for the year has not been published, but was somewhere near \$800,000, about \$500,000 of which was spent for additional buildings. Three stone buildings were completed during the year, ten are in course of construction, and six more are contemplated in the near future. All of the buildings are being built out of the income, the original building fund having been turned into permanent endowment. The second, or outer quadrangle, is being completed, and in addition a large chemistry building, two engineering buildings, and a costly and very beautiful memorial church are almost ready for use. A large stone gymnasium is to be built in 1902. On December 9, 1901, Mrs. Stanford, in accordance with an amendment to the State constitution, adopted in 1900, consummated her long-cherished wish by deeding to the university the bulk of her property, consisting of \$18,000,000 in government bonds and other first-class income-bearing securities, and nearly 100,000 acres of land, situated in twenty-six counties in California, estimated as worth \$12,000,000. The university plant and endowment together should be worth at least \$35,000,000. At the same time contracts were signed which completed plans for the outlay of a total of \$1,500,000 for new buildings. All of the new buildings follow the original plans by Richardson.

From the first the university has taken the stand that its province is not to prescribe what the high schools shall do, but only to test the quality of the work done, thus leaving to the high schools complete liberty to do what they deem best for the individual or the community. Training for individual efficiency is the aim of the institution. There are no required courses, culture or disciplinary, through which all must pass. Probably no two students have the same course of study. The requirements for graduation are: Four years of undergraduate study directed toward some special end. Each student is required to select some subject, as history, or Latin, or botany, as his major subject, and to devote one-third of his time to it, or to it and some closely allied minor. The major professor becomes his educational adviser. He outlines the major work to be done, advises him as to his collateral work, and approves the selection of courses made by the student. In general, the student may select two-thirds of his work as he wishes, taking those courses which he thinks will be of most benefit to him and coming into contact with the men who, for his purpose, are most worth knowing. At the end of the course, all students alike, whatever may have been the major subject, receive the degree of B.A., this being the only baccalaureate degree granted by the university. The university maintains one professional school, that of law, and grants the professional degree of LL.B. on the completion of a three-year course following the baccalaureate degree. It is possible, however, for an undergraduate to elect law as his major subject and complete one of the three years of work in law as a part of his work for the B.A. degree, thus completing his professional work in two years after graduation. Enough of the development of the university has taken place to indicate something as to its future policy. The university will undoubtedly have a tremendous development in the next ten years, but this development is likely to be not so much an increase in the number of students as a growth in individual research. The president holds that it is the first duty of a university to teach and direct; that whatever a university attempts should be done well, and that the purpose of a university is to train men for *individual efficiency*. See **UNIVERSITIES AND COLLEGES AND CALIFORNIA**.

LEPROSY. A revival of interest in leprosy occurred in 1901, and systematic efforts to obtain an accurate census of the unhappy victims of this disease have been made in many countries. Twenty years ago leprosy was scarcely known in France. To-day, according to the reports of Dr. Besmier, the disease is very prevalent in Brittany and Savoy, which are now recognized leprosy centres. Russian authorities report cases of the scourge in Lifland and Smolensk. The United States consul has reported the existence of 200 lepers on the island of Teneriffe, Canary Islands. At Santa Cruz de Teneriffe he states there are about 220 inhabitants, of whom 22 are lepers. Germany, Russia, and Roumania decided in 1901 to issue no passports to lepers, after mutual agreement. The latest annual report of the minister of agriculture of Canada, published in 1901, states the extent of leprosy in the dominion. At the Lazaretto at Tracadie, N. B., on October 31, 1900, there were 20 lepers, 13 males and 7 females, ranging from 19 to 64 years of age. During the past year there were 4 deaths and 3 admissions. Dr. A. C. Smith, the medical superintendent, treated less advanced cases of the disease with chaulmoogra oil and creolin, with some

success. On Darcy Island, B. C., there are 5 lepers, all Chinese males. Besides these, there are 5 other lepers known to be in Canada, one in each of the following localities in the province of British Columbia: Victoria, Vancouver, Nanaimo, Kamloops. In 1899 Drs. J. H. White, G. T. Vaughan, and M. J. Rosenau were appointed from the Marine Hospital Service as a special board to investigate leprosy in the United States. It is said that they will report early in 1902 to Congress that about 900 cases of leprosy exist in the country, exclusive of the insular possessions. In New Orleans, 74 cases chiefly among Italians, were found. In Minnesota 23 cases, chiefly rural Scandinavians, are reported. In North Dakota 15, and in South Dakota 2 Scandinavian lepers were found. Chicago furnishes 5 cases; New York, 6 cases; St. Louis, 1 case—a Chinaman. The board will recommend to the legislators to erect a government hospital for lepers in the North and another in the South, into which all the cases shall be gathered. The lepers in the Philippine Islands have not yet been counted. A board of United States army officers, recently appointed for the purpose of selecting a suitable spot for the segregation of the victims of leprosy, recommends the island of Barri, of the Batanes Islands. A systematic search for lepers in the Hawaiian Islands reveals the fact that the disease is gradually decreasing; the new cases in 1900 numbering 85 as compared with 132 in 1890. At the Molakai leper settlement there are now 909 lepers and 164 clean persons, who are maintained, fed, housed, clothed, and governed at an expense of \$80,000 a year. Under the new rules of the Marine Hospital officials, visitors are not permitted to embrace, kiss, or touch their leprous friends, as formerly, while they are allowed to visit them at any time, though separated from them by a double wire fence. There are three patients in the colony who arrived in 1874, 1875, and 1879 respectively.

LEWIS, Most Rev. JOHN TRAVERS, Anglican archbishop of Ontario, Canada, died en route from Canada to England, May 6, 1901. He was born at Garrycloyne Castle, Ireland, June 20, 1825, and was educated at Trinity College, Dublin. Ordained deacon in 1848 and priest in 1849 in Ireland, Father Lewis went to Canada in 1850. He was elected first bishop of Ontario (1861), Metropolitan of Canada in 1893, and archbishop of Ontario in 1894. During his episcopate of almost forty years, nearly 300 churches, besides schools and parsonages, were erected under Father Lewis' direction. He was the author of many volumes of sermons and lectures, and was a frequent contributor to various religious periodicals. He received the degrees of D.D. and LL.D. from Trinity College, Dublin, and D.C.L. from Trinity University, Toronto.

LEWIS, SAMUEL T., English money-lender, called the "greatest and meanest of modern Shylocks," died in London, January 13, 1901. Of his early life nothing is known, except that he was born in 1837. Starting business on a small scale in London, his operations extended until his clientèle was composed entirely of the nobility and the very rich. Transactions that legal proceedings have revealed show a relentless persecution of his debtors; but while merciless with the wealthy, his charity to the poor formed a striking contrast. His will bequeathed \$5,000,000 to various charitable works.

LIBERIA, a negro republic of Africa, lying on the Guinea coast and extending inland about 250 miles, has a probable area of about 75,000 square miles. The boundary between Liberia and French Guinea has not been defined. The population is variously estimated at from 1,500,000 to 2,000,000, and the Americo-Liberian population (negro settlers from America and their descendants) at from 24,000 to 60,000, the best authorities inclining to the larger estimate. Monrovia, the capital, has 5,000 to 6,000 inhabitants. The civilized population is wholly Protestant. American missions are established. All the towns and villages near the coast have elementary schools; there are some higher schools, and a college, for a time dormant, has been reopened.

Liberia is a constitutional republic modeled after the United States, the executive authority being vested in a president and the legislative in a congress of two houses. The president in 1901 was Mr. George W. Gibson, who was elected by special legislation in December, 1900, to succeed Mr. William D. Coleman, resigned. Electors must be of negro blood and land owners.

All citizens between 16 and 50 years of age, able to bear arms, are liable to military service. There is a regular army of 1,000 men and a militia and volunteer force of about 500. The budget for 1900 balanced at \$194,660. Revenue is mainly derived from customs duties. The financial condition and credit of Liberia are poor. In 1899 an agreement was reached with the creditors by which the debt was to be amortized and arrears of interest made up. The rate of interest was reduced and customs duties on rubber and some other articles were assigned as security. The debt in June, 1900, including interest arrears, amounted to £96,720 (\$470,687).

The chief products are palm oil, coffee, rubber, sugar, hides, cacao, and arrowroot.

Methods of agriculture are unprogressive. The total imports for 1901 are estimated at \$500,000, including rum, cotton goods, hardware, and provisions; exports, \$450,000. In 1899 the exports to Great Britain amounted to \$250,000. The Liberian government furnishes no available trade statistics. Foreigners are allowed to trade only at the ports of entry, and the country is developed only along a narrow fringe of the coast.

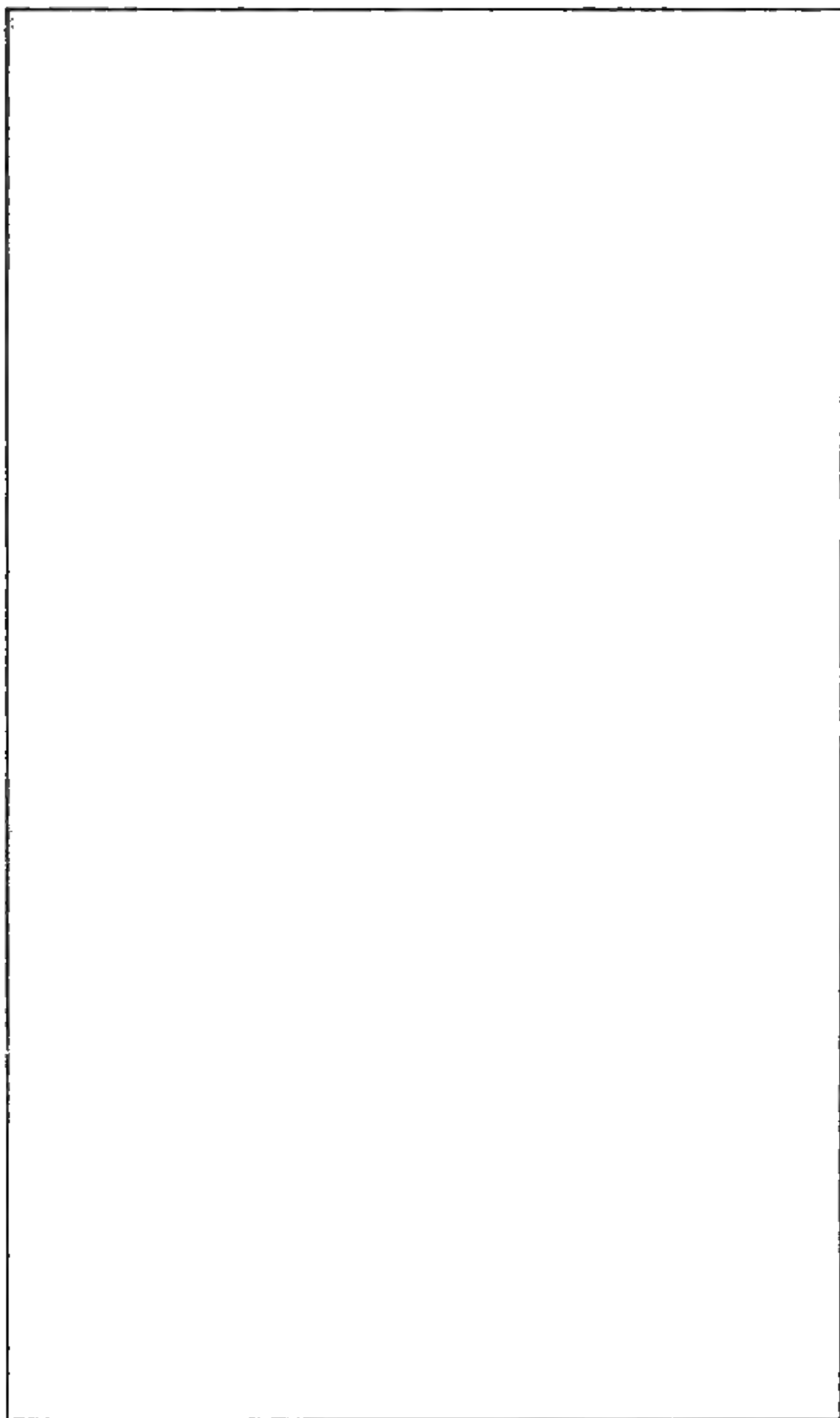
The United States consul at Monrovia reported, February 28, 1901, that the Liberian government had granted to a Boston company concessions under which a steamship line would be established between Liberia and Boston. The company is to build wharves, quays, railways, and tramways, and carry on a system of mining operations for a period of fifty years. A line of telephone, the longest in the country, has been completed between Monrovia and White Plains, 25 miles. Early in 1901 the legislature granted to the Liberia Union Mining Company a monopoly of the mining privileges of Montserrado and Maryland counties for a period of years, including the right to build railroads, wharves, and telegraph and telephone lines. This concession was presently sold to English capitalists.

LIBRARIES, GIFTS TO. According to a report prepared by Mr. George Watson Cole, of the American Library Association, the total gifts and bequests to American libraries during the twelve months ending July 1, 1901, were \$19,786,465.16, besides 145,361 volumes, and 20,856 pamphlets. These figures do not include several buildings and other gifts, the value of which was not stated. The aggregate of gifts due to the generosity of Mr. Andrew Carnegie (*q.v.*) reached \$13,704,700, over \$12,500,000 of which was given for the erection of library buildings. During the remaining months of 1901 Mr. Carnegie increased this sum by gifts aggregating \$1,350,000 for libraries in the United States and \$282,000 for those in Canada. In most cases, the Carnegie gift carried with it the condition that the town receiving it should furnish a site for the building and should appropriate for the maintenance of the library an annual sum equivalent to 10 per cent. of the gift. Besides Mr. Carnegie's gift to the city of New York of \$5,200,000 for the erection of sixty-five or more branch libraries, he gave \$1,000,000 to the city of St. Louis for library buildings and \$1,000,000 as an endowment fund for the Carnegie libraries at Braddock, Duquesne, and Homestead, Pa. He also gave \$750,000 each (announced after July 1) to Detroit and San Francisco. During the period referred to Mr. Carnegie's library gifts aggregated 112 in the United States, 6 in Canada, and 3 in Scotland. Syracuse, N. Y., received \$260,000 from this source; Seattle, Wash., \$200,000; and \$100,000 was received for libraries at Leadville, Colo.; Decatur, Rockford, and Springfield, Ill.; Fort Wayne, Ind.; Jackson, Mich.; South Omaha, Neb.; Conneaut, O.; Richmond, Va.; and Wheeling, W. Va. Over a score of towns or institutions received gifts of \$50,000 from Mr. Carnegie, four received \$40,000, four \$35,000, eight \$30,000, and over twenty received gifts of \$25,000 for libraries. The Carnegie gifts were supplemented by many important gifts from other wealthy Americans, including \$400,000 for the new Carnegie library at St. Louis, by four residents of that city; \$250,000 by bequest of Judge John Handley to Winchester, Va.; \$150,000 to the Clark University library from its late founder; \$125,000 from Elisha D. Conover to Malden, Mass.; \$100,000, by bequest or otherwise, from T. B. Blackstone to the Blackstone Memorial Library at Chicago; Elisha Turner to Torrington, Conn.; Marshall Field to Conway, Mass.; and Fairhaven Waterworks (\$100,000 to \$125,000) to Fairhaven, Mass., besides a large number of gifts ranging from \$75,000 down. The library of the Academy of Natural Sciences will share in the bequest of \$500,000 from Dr. Robert B. Lamborn. Since the meeting of the American Library Association in July, additional gifts of importance, aside from those made by Mr. Carnegie, are as follows: One of \$200,000 by Mr. Frank H. Buhl for a library at Sharon, Pa.; one of \$100,000 to the public library at Chicago by Mrs. T. B. Blackstone; \$150,000 for a public library at Westerly, R. I., by Mrs. Harriet Wilcox; and gifts of \$50,000 by Mr. Peter Reid to Passaic, N. J., and by Mr. Thomas S. Pierce to Middleboro, Miss. Perhaps the most notable library addition was the acquisition by Brown University of the John Carter Brown library, which contains one of the finest collections of early Americana in this country, and many books not found in any other American library. Its value is estimated to be at least \$1,000,000, and the gift carries with it the sum of \$150,000 for a library building and \$500,000 for endowment. The Yale library received from Mr. Morris K. Jesup a rich collection of Arabic manuscripts, covering the whole range of Arabic history and literature, dating back to the 12th and 13th centuries. The collection was formed by Count Landberg. The Yale library also acquired the private library of the late Professor O. C. Marsh, dealing mainly with paleontology. Among the foreign gifts reported are \$50,000 to Vancouver, \$100,000 to Ottawa, \$100,000 to Winnipeg, \$75,000 to Halifax, all from Andrew Carnegie, as well as \$115,000 for Scottish libraries at Glasgow, Greenock, and Hawick. McGill University in Canada received about \$40,000, and Trinidad, Cuba, received a bequest of a public library from Mary B. Carret.

LIBRARY ASSOCIATION, AMERICAN, organized in Philadelphia in 1876. It aims to advance library interests generally, and has for its motto: "The best reading for the largest numbers at the least cost." It seeks to develop and strengthen the public library as an essential part of the American educational system, and strives to stimulate public interest in establishing and improving libraries, and therefore bring the best reading matter within the reach of all. By organization and cooperation it effects needed reforms, and lessens the labors and expense of library administration. As an outcome of its work and influence, 25 State library associations have been formed and 12 important library clubs. The official organ is the *Library Journal* (monthly). The twenty-third general meeting of the association was held July 4-10 at Waukesha, Wis., with an attendance of 460. Among the topics presented in papers and addresses were *Being a Historian*, address of the president; *What May be Done for Libraries by the City*, T. L. Montgomery, trustee Philadelphia Free Library; *By the State*, E. A. Birge, president board of directors, Madison (Wis.) Public Library; *By the Nation*, Herbert Putnam, librarian of Congress; *The Trusteeship of Literature*, by George Iles, New York, and Professor Richard T. Ely, University of Wisconsin; *The Departmental Library*, James T. Gerould, University of Missouri; *Suggestions for an Annual List of American Theses for the Degree of Ph.D.*, W. W. Bishop, Polytechnic Institute, Brooklyn, New York City; *Vitalising the Relation Between the Library and the School*, Mary L. Prentice, Cleveland Normal School, and Irene Warren, librarian University of Chicago's School of Education. One of the most important papers of the session was that of Mr. Putnam, who outlined the methods by which the national library wishes to get in touch with local libraries. One of these is by the loan system; and a second, the general distribution of printed cards, and an exchange of such from local libraries. Such an exchange has already been begun. "In the new building of the New York Public Library there will be a section of the public card catalogue designated The Catalogue of the Library of Congress. It will contain at least every title in the Library of Congress not to be found in any library of the metropolis. In the Library of Congress a section of the great card catalogue of American libraries outside the District will be a catalogue of the New York Public Library." One of the aims of the Library of Congress, then, is to become a bibliographic bureau for the United States, and, as far as possible, a circulating library, for the whole country. President of the association, Henry J. Carr, Scranton (Pa.) Public Library; secretary, Frederick W. Faxon, Dorchester, Mass.

LIFE-SAVING SERVICE, attached to the United States Treasury Department. At the close of the fiscal year ending June 30, 1901, the life-saving system showed 270 stations, of which 195 are on the Atlantic coast, 58 on the Lakes, 16 on the Pacific coast, and 1 at the falls of the Ohio, Louisville, Ky. The statistics of the service for the year ending June 30, 1901, are as follows: Disasters, 377; value of property involved, \$7,354,000; value of property saved, \$6,405,035; value of property lost, \$948,965; persons involved, 2,849; persons lost, 8; shipwrecked persons succored at stations, 647; days' succor afforded, 1,214; vessels totally lost on United States coast, 43. There were in addition, 393 casualties to small craft, such as sailboats, etc., on which there were 927 persons, of which 917 were saved and 10 lost. The cost of maintenance of the service for the year amounted to \$1,640,013.74.

LI HUNG CHANG, Chinese statesman, died in Peking, November 7, 1901. He was born at Hweiling, province of An-hwai in 1822, of comparatively humble origin, and successfully passed the rigid examinations required of those who would be admitted to the literary caste and be considered for political preferment. In the Taiping Rebellion (1850-65), in conjunction with Ward and "Chinese" Gordon, he conducted the operations that finally made the imperial army victorious. At the end of the rebellion, after General Gordon had promised immunity to the defeated leaders, Li Hung Chang asserted himself and summarily decapitated them, for which breach of faith Gordon severed his connection with the imperial army. In recognition of his services, Li Hung Chang was made in succession governor of the provinces of Fokien and Kiangsu, and in 1867, at the outbreak of the Shantung rebellion, he again took the field and defeated the rebels. He was made viceroy of Chili in 1870, the most important post in the empire, lying as it does between the capital and the sea, the bar between what is anciently and conservatively Chinese and the prying eyes and civilizing influence of the outer "barbarians." For twenty-four years he held this post, absorbing from the foreigners with whom he came in contact many new ideas. He reorganized the Chinese army and navy, introduced the telegraph, built thirty miles of railway (from Taku to Tientsin), encouraged native shipping and trading, created an arsenal, opened schools, founded a hospital, and instituted many other innovations in spite of native opposition. Up to the time of the breaking out of the war between China and Japan in 1894, Li Hung Chang's power steadily increased. He had espoused the cause of the empress dowager, Tzu-Hszi, a widow of the Emperor Hien-Feng, and helped to establish her claim to power. But the



LI HUNG CHANG.

disastrous outcome of the war with Japan brought disgrace and degradation to the viceroy. He was stripped of his honors and power, but was in the end selected to conclude peace with China's conqueror. In 1896 he represented China at the coronation of Czar Nicholas II., and while returning home visited the principal capitals of Europe and America, turning his journey into a sort of triumphal progress. His last great service to China was in the settlement of the Boxer troubles, for which he was recalled to Tientsin from Canton, whither he had been sent, when partially restored to favor in 1897, in the capacity of viceroy of the provinces of Kwangtung and Kwang-si. From 1870 until 1895 Li Hung Chang was almost exclusively responsible for China's foreign policy, and to western minds personified the empire. Absorbent of new political and military ideas wherever found, he applied them to China's needs as he deemed best, and to his innovations much of the advance of the empire is due. His diplomacy was of the evasive, procrastinating type that aroused great impatience with envoys of other countries who met him in negotiations, particularly in the Boxer settlements. During the last year of his life he presented a striking spectacle—that of the statesman discredited by his government, but summoned to her aid when superlative cunning was required to meet the wrath of offended foreign powers.

LINDSAY, ROBERT JAMES. See WANTAGE, BARON.

LIPTON, Sir THOMAS JOHNSTONE, British merchant and yachtsman, made a second unsuccessful attempt to win the America's Cup with his yacht, *Shamrock II.*, over the Sandy Hook course in the autumn of 1901. He was born at Glasgow, Scotland, in 1855, of Irish parentage, and came to the United States while a boy and worked at various employments in South Carolina, New York, and elsewhere. With five hundred dollars earned in this manner he opened a provision store at Glasgow in 1876, and from that time his business developed, until now he controls four hundred and fifty stores in Great Britain, extensive tea, coffee, and cacao estates in Ceylon and India, a large pork-packing business in Chicago, and a line of refrigerating cars. In 1899 his *Shamrock I.* was defeated in the international yacht race by the *Columbia*, the same yacht that beat *Shamrock II.* See YACHTING.

LITERATURE, AMERICAN AND ENGLISH. *Fiction.*—While a survey of the fiction of 1901 shows that the general tendencies are substantially the same as in the years immediately preceding, the resulting impression as a whole is distinctly encouraging, and the exceptional quality of just a few unique volumes stamps the past season as a notable one. In this country the remarkable vogue of the colonial novel, which began two seasons ago with *Richard Carvel* and *Janice Meredith*, has continued unabated, notwithstanding frequent prophecies to the contrary; while the substantial reward which awaits a successful story of this type has proved an irresistible temptation to more than one well-known novelist, who, like Miss Wilkins and Miss Jewett, had hitherto been identified with novels of a very different quality. A work of far more significance and interest is being accomplished by a group of earnest writers, mostly of the younger generation, in the novel of contemporary life. The group includes men of such different methods and ideals as Will Payne, Robert Herrick, and Frank Norris, all striving in their several ways to depict certain vital phases of typically American life and character. It is significant that quite a number of these novels have received encouraging notice from English critics, whose attitude toward some of the best-selling colonial romances has been merely one of tolerant condescension. In England the day of the historical novel seems to have quite gone by, and Stanley Weyman and Rider Haggard are the only really familiar names in the season's list. Even Maurice Hewlett's remarkable *tour de force*, *Richard Yea-and-Nay*, which was one of the literary events of the preceding year, has found no imitators. The stories which have recently appealed to the British public are, with a single exception, stories of contemporary England, social and political, character studies of typically English men and women. And the one exception, Kipling's *Kim*, is not wholly an exception after all, since it deals with an integral part of the British empire, modern India, and to an appreciable degree with the Anglo-Saxon contingent.

From the ranks of the older writers, two notable figures passed away during 1901—Sir Walter Besant and Robert Buchanan (*qq.v.*). Among those still living, the two most prominent, George Meredith and Thomas Hardy, seemed to have retired definitely from fiction, although each is represented in the season's literature by a noteworthy volume of verse. Henry James has published nothing new since the subtleties of *The Sacred Fount* perplexed even his most devoted followers, and Mr. Barrie's name is also missing from the list. On the other hand, the two men among the younger generation, who, for very different reasons, offer great promise in contemporary fiction, Mr. Kipling and Mr. Hewlett, are both represented; and there are also volumes of serious interest by George Moore, Anthony Hope, George Gissing, Eden Philpotts, Gwendolen Keats, and Mrs. Henry Dudeney; while what came near to being the novel of the year came from quite an unexpected source—Charles Kingsley's daughter, "Lucas Malet." Mr. Hewlett is said to have in preparation a new historical ro-

mance, the central figure of which will be Mary Queen of Scots. His only published volume for the year, however, is not a novel but a collection of *New Canterbury Tales*, stories with a distinctive mediæval flavor, loosely bound together by bits of interspersed dialogue, after the Chaucerian model, but infinitely more sophisticated. They bear the stamp of that artistic finish of which Mr. Hewlett is past master, yet coming immediately after his *Richard Yea-and-Nay*, they suffer by contrast with the nervous force and lofty energy of the latter. In the opinion of a substantial majority, Mr. Kipling's *Kim* is little less than a masterpiece. The verdict of critics in England was not quite so unanimous as in this country, yet on both sides it was recognized that *Kim* was an all-sufficient answer to those who questioned whether the author of *Soldiers Three* had not written himself out. *Kim* has been criticised for its faulty construction, its absence of love interest, its author's disregard of the conventional technic of fiction. But this was because some critics failed to recognize that the central figure is not little Kim, the Anglo-Indian waif with a man's head on his small shoulders, nor the venerable Thibetan Lama, with the stored-up wisdom of centuries, and the simple heart of a little child. The central figure is neither a man nor a woman, but a nation, the dominant spirit of all India. Whether *Kim* is an enduring masterpiece or a brilliant meteoric flash in our ephemeral literature, its interest in either case lies in its aspect as an attempt to sum up a nation's life in a broad, epic way; to give a vast composite picture of one of the most complex and puzzling civilizations in the world; to show the curious contrasts afforded between the various layers and substrata in its social structure—the rather obvious life of the average Anglo-Indian resident; the surface life of the natives, with the glitter and brilliance of its bazaars, the blaze of Oriental color with which the casual tourist comes in contact; the less known and less understood inner life with its prejudices of race and caste, its superstitions and traditions dating back through unknown generations to the childhood of the race; and lastly the vast system of espionage, the British secret service, spreading like a huge net all over India, and binding together quite impartially all ranks and castes in its embrace, just as it binds together all the motley and separate pictures of Mr. Kipling's huge cyclorama. Whatever the verdict of posterity may be upon *Kim*, one feels at least that no other living man could have written it.

Kipling's *Kim* stands in a class apart, but scarcely more isolated than the volume which came in for the next largest share of attention, Lucas Malet's *History of Sir Richard Calmady*. This story is a powerful, sombre, and at times intensely dramatic psychological study of the victims of nature in her unkindest mood. The hero, heir to a long line of proud, brave, and handsome men, inherits the stalwart shoulders, classic features, and brilliant mind which are his birthright, but below the waist he is a cripple—a grotesque and pitiful monstrosity. His deformity is the result of a prenatal shock, when his mother saw her husband borne home from the hunting-field, to suffer the amputation of both limbs in a fruitless endeavor to save his life. And the child born a few months later is similarly mutilated, destined to hobble his way through life in a grotesque shuffle, or to sit helplessly on a sofa, hiding as best he may the ghastly rigidity of his crippled limbs. The story is frank, at times almost brutally so; and its power lies not so much in the character of Sir Richard as in the morbid subtlety with which he is used as a medium for analyzing the complicated emotions of the three women whose destinies are bound up in his own. Another volume which is essentially an introspective study of a woman's heart is George Moore's *Sister Teresa*. Taken in conjunction with *Evelyn Innes*, to which it forms a sequel, it gives the life history of a beautiful singer, and of the inner struggle which goes on between the spiritual and the sensual demands of her nature. Aside from the subtle insight shown into feminine character, the book has been admired for its vivid and artistic picture of life in the Passionist convent in which Evelyn at last takes permanent refuge. Another volume which it seems natural to mention here, not because it stands upon the same plane, but because it deals with a spiritual struggle, is Hall Caine's *The Eternal City*. In point of artistic worth, this book cannot be said to be either an advance upon Mr. Caine's earlier works or a retrogression. It has both the merits and the faults of *The Christian*, with the same underlying strain of melodrama. Like Zola in France, and Mrs. Humphry Ward in England, he has gone to Rome for the setting of his story, and there throughout a maze of strange political happenings, the abdication of the king, the establishment of a republic, and the surrender of the Pope's temporal power, he strives to trace the redemption of a human soul.

Our Friend the Charlatan, by George Gissing, is a volume which has attracted a wider circle of readers than this exceptionally clever writer usually reaches. For the first time he has risen above the sordid vulgarity of that lower middle class which he knows how to paint with such unsparing fidelity, to a higher and more congenial social stratum, and his characters this time are at least familiar with the usages of refined society. Dyce Lashmar, the charlatan of the title, is a type which deserves to

be remembered in literature. With a little more intellectual force, a little coarser moral fibre, he might have carried to a triumphant conclusion his self-seeking schemes, instead of ending in an inglorious downfall. Yet in success and failure alike, he remains an interesting study of egotism. Another book, which has many of the qualities of Mr. Gissing's novel, is Anthony Hope's *Tristram of Blent*. When *Quisante* appeared two years ago, that able picture of the parvenu politician who aspired to be a statesman, readers of *The Prisoner of Zenda* and *The Dolly Dialogues* suddenly realized that here was a new Anthony Hope, with gifts of observation and character painting hitherto unsuspected. In his new story, Mr. Hope lays his scenes in a less imposing milieu, and makes the interest of his plot hinge upon a well-kept family secret—the question of the legitimacy of the heir of Blent. But the careful workmanship and artistic finish, the vigorous handling of the characters, even of those minor types that stand perilously near the borderline of caricature, led the critics to recognize this novel quickly as the maturest work that has yet come from Mr. Hope's pen, and one which places him in the front rank of English novelists. The late Mr. Blackmore has been fortunate in having at least two able writers to receive his mantle and have a care that Devonshire should not be neglected in fiction. One of these is Eden Phillpotts, whose latest novel, *The Good Red Earth*, though lacking the inherent strength of *Children of the Mist*, is an agreeable little love story with a high-born heroine who grows up in ignorance of her station and learns to love the sturdy young farmer whose devotion merits the reward. Mr. Phillpotts also has the gift of telling a short story well, and this he shows in a volume of Dartmoor sketches, *The Striking Hours*—a name borrowed from a little-known volume of essays by Dr. Martineau. The other author who makes Devonshire the background of her stories is Gwendolen Keats, who writes under the pseudonym of "Zack," and whose chief preoccupation is the narrow lives and ignorant, superstitious, often bigoted natures of the humble fisher folk of that stormy coast. Her latest story, *The White Cottage*, is a study of the perversity of a woman's heart, and how she cast aside the love of an honest man, whom common-sense and self-interest and her own better nature all urged her to accept, and threw herself away upon a worthless and unscrupulous stranger, who happened to have that indefinable, compelling power which just a few men possess. This was hardly the sort of theme to be looked for from the author of *Life is Life*. It is rather the sort of problem in which Mrs. Henry Dudeney delights and which she has handled in a masterly fashion in *Folly Corner*. In her latest story, *Spindle and Plough* (which belongs properly to last year's literature, although its publication in America was postponed beyond the year), Mrs. Dudeney apparently branches out into a new and untried path, although in reality she is simply studying a new phase of the problem which seems always to preoccupy her—the struggle which often takes place in a woman's heart between the instinct of independence, freedom, and self-preservation, and the instinct of sex, of sacrifice and self-surrender. In the heroine of *Folly Corner*, the second instinct was all-powerful. She left home, happiness, honor, for poverty, misery, and shame, at the careless call of the one man whose voice was irresistible to her. The heroine of *Spindle and Plough* makes an interesting contrast. She is a big, athletic, clean-minded young woman, in whom the maternal instinct is strong, yet holding men and love and marriage in contempt. By choice, she makes her life-work professional gardening, finding her happiness in close contact with nature and out-door life, and young, tender, growing things. Yet love comes at last, even to a nature like hers; but so long as it comes imperiously, in a man's compelling voice of authority, she cannot accept it. It is only years later, when the man returns, poor, humbled, broken in spirit, when her part is to give and not to receive, that she can lay aside her pride and her independence. Another woman writer, who excels in her presentment of village life, and in an almost Austen-like talent for seizing the trivialities of village gossip, is Mrs. C. L. Antrobus, whose *Quality Corner* is an interesting picture of an out-of-the-way corner of England, marred by the melodramatic extravagance of the central plot. Of quite a different calibre is *The House with the Green Shutters*, by a new writer, George Douglas. It is a grim, compelling sort of story, told in monochrome, and the scene is laid in a small Scots country town. The owner of the House with the Green Shutters, Gourlay, is a hard, masterful, vindictive man, "dour" in the full sense of that expressive Scotch word, who, without any natural endowments or education, has climbed to the very summit of his ambitions as the big man of the town, rather through the comparative inferiority of his neighbors than through his own ability. But all of a sudden an outsider comes, a little, crafty, clever man, who, spurred on by ambition and a fancied grievance, deliberately sets out to undermine and ruin Gourlay, putting him through a lingering martyrdom, that ends in a wholesale tragedy.

There are a number of popular writers from whom an annual volume is expected, and none more popular in a certain circle than Stanley Weyman. *Count Hannibal* is the title of Mr. Weyman's latest Dumasesque romance, the time being the

massacre of St. Bartholomew, the scene, Paris and the south of France; and the hero, a French gentleman who compels the heroine to marry him in spite of her hatred, to defy him in spite of her fear, and finally to love him in spite of everything. Judged by the standard of the average historical novel, *Count Hannibal* is a volume of distinct merit. Mr. Rider Haggard's new book, *Lysbeth*, is a tale of Dutch life in the sixteenth century, under Philip II. and William the Silent, a period when Spanish tyrannies gave scope for thrilling adventures. Mr. Crockett has roamed so often of late among the hills and valleys of the Continental states that it is pleasant to find him in *Cinderella* once more back amid the familiar scenes of his native heath. It has received some cordial indorsements as an enjoyable little love story, with abundant sparkle and freshness, and a fund of typical Scottish characters. What Mr. Crockett and Mr. Barrie have done for Scotland, Miss Jane Barlow does in her own way for Ireland, and each year she gives a new volume of her inimitable Irish stories, of which at least one is expected to be a new chapter in the annals of Lisconnell. This year her title was *From the Land of the Shamrock*. There are so many volumes this year claiming attention that it is impossible to do more than mention the clever studies of femininity that Maarten Maartens has grouped under the title, *Some Women I Have Known*; a fantastic romance called *The Inheritors*, which deals with a mysterious "Fourth Dimension," and is the joint work of Joseph Conrad and F. M. Hueffer; *The First Men in the Moon*, the latest of H. G. Wells's daring flights of fancy, dealing with a strange race of gigantic, ant-like beings called Selenites, supposed to inhabit the interior of the moon; and finally *Jack Raymond*, an unpleasant story by Mrs. Voynich, who will be remembered as author of *The Gadfly*. The events turn mainly upon the cruel treatment of a schoolboy, who is accused of vices of which in point of fact he is too young to understand the meaning.

In turning to American novels, it is somewhat puzzling to know just where to begin the survey, for our older and better-known novelists have done comparatively little in support of their claim to priority. Mr. Howells has this year concentrated his energies upon a work of literary criticism, *Heroines of Fiction*, which will be referred to again in its proper place. His only contribution to fiction is a volume of short stories, *A Pair of Patient Lovers*—slight, ephemeral creations, whose essence seems to evaporate before any attempt at clumsy retelling or analysis. Yet in the insight they give into the subtler problems of existence, the delicate half-tones of inner life, they are perhaps of more value than many of the more pretentious efforts. *The Cavalier*, Mr. Cable's new volume, being essentially a historical novel, may be reserved for discussion under that head, and the same statement applies to the new stories by Robert Chambers, Marion Crawford, Sarah Orne Jewett, and Mrs. Catherwood. The most serious attempts in fiction of the past year, understanding fiction in the sense of an interpretation and criticism of contemporary life, have been made by the younger generation of American writers, many of them practically newcomers in literature. Unlike that earlier group of writers, Miss Wilkins and Miss Jewett, George W. Cable, Charles Egbert Craddock and Octave Thanet, each of whom stood definitely and unmistakably for a narrow section of American life, laying on their local color with the minuteness of a miniature painter, these newcomers in fiction strive frankly for scenes and characters which will typify American life as a whole. Consequently they are compelled to work in bolder, broader lines, in a more impressionistic style, and it is not surprising that the results are at times somewhat crude. It is interesting to find that a majority of this group go to the west, from Chicago all the way to the Pacific slope, for types and scenes which they consider representatively American. The biggest and boldest effort of the year, even if in some ways it was a mistake, was Frank Norris's *Octopus*. Two years earlier, the publication of *McTeague* had stamped Mr. Norris as a realistic writer of considerable promise, an avowed disciple of Zola, whose use of some central, symbolic idea in each novel, he imitated frankly and effectively. *The Octopus* is a far more ambitious and comprehensive effort. It forms the first part of a trilogy, *The Epic of the Wheat*, in which the author planned to symbolize American life as a whole, its resources, its aspirations, its destiny. This first volume deals with the wheat in the grain, its luxurious growth in the wide, fertile stretches of the San Joaquin Valley; the prolonged struggle of the farmers against the aggression of the local railroad, which typifies the eternal struggle between capital and labor, and by loans and foreclosures and unjust freight-rates, little by little gets the farmers into its power, until its very rails seem to their excited imagination like vast tentacles stretching out octopus-like to seize and swallow up the land. But while the individual succumbs, the wheat remains, emblem of American prosperity, rising and augmenting and gathering strength to roll eastward like a vast golden wave, across the continent and across the ocean, to bring health and wealth and strength to other nations. This in brief seems to be the basic idea in Mr. Norris's new symbolic novel, and thus stated it contains a certain degree of impressiveness. The difficulty lies in the execution; since it is very difficult to develop effectively these big central ideas

without at the same time sacrificing the human interest of the individual characters; and it is just here that some critics have found Mr. Norris's book disappointing. Two volumes which bear a striking resemblance in their inception, central characters and development of plot up to a certain point are Will Payne's *Story of Eva*, and Theodore Dreiser's *Sister Carrie*. In each case the heroine is a young and attractive woman, whom fate has suddenly transferred from the seclusion of a country town, and plunged into the maelstrom of Chicago life, to face the problem of earning her own living. In each case, the problem taxes the girl beyond her strength, and she falls a ready prey to the first well-dressed stranger who volunteers to assume the responsibility. The case itself is commonplace enough. The merit of both of these books is the obvious truth of the picture they present, the clever analysis of mood, the emphasis laid upon the little details of life which really count. Beyond a certain chapter, however, these books cease to have anything in common, for Eva redeems her past by a conventional if rather tardy marriage; while Carrie goes triumphantly along the upward path of a successful comic opera star, incidentally dragging down to ruin the man through whose aid she has climbed. The London *Academy* defines it as "An American *Nana*, worthy to stand beside Zola's story on the shelves of any library." Robert Herrick, who is known in university circles as a professor of rhetoric, and among novel readers as a clever interpreter of feminine moods and tenses, has probably put more conscientious labor into *The Real World* than into any of his earlier efforts. It depicts the upward rise of a typical young American, his successful struggle for an education, the part played in his life by two women of sharply contrasted natures, and his ultimate discovery that for every man there are two worlds, the external world around him, and that other, inner world which each may create for himself in his own heart. *The New Americans*, by Alfred Hodder, is a carefully written volume with a serious purpose and a crisp, epigrammatic style. It is a study of the Americans of to-day, and especially the American women, the basic idea being that a greater forward stride has been made by the last generation than any two others that have gone before it. Other western stories which have attracted attention are *The Autocrats*, by Charles Lush, and *The Westerners*, by Stewart Edward White. John Uri Lloyd, whose *Stringtown on the Pike* was among the successful novels of 1900, wrote *Warwick of the Knobs* which, like its predecessor, deals sympathetically with the primitive life of the Kentucky mountain settlements.

Mr. Hamlin Garland is a writer who has hitherto stood for the typical exponent of life in the middle west. *Her Mountain Lover* opens after his usual fashion with an exhilarating breath from the western plains; but after a few chapters the scene shifts abruptly to a London drawing-room, where the cowboy hero finds himself somewhat out of his element. A surprise of quite a different kind is afforded by Gilbert Parker's *Right of Way*, for it proved to be a story of rather unexpected strength. The hero is a brilliant lawyer, with a besetting weakness, intemperance; and in consequence of injuries received in a drunken brawl, loses all knowledge of his identity. When his memory returns long afterwards, he comes back to his home, only to find, like Enoch Arden, that his place has been taken by another man. The question for him to solve is which of the two has the right of way. The true interest of the book, however, lies less in the plot than in the strongly drawn character of the lawyer, Charlie Steel. A novel which is visibly the outcome of long pent-up feeling is *The Marrow of Tradition*, by Charles W. Chesnutt. It is a study of the race problem in the south, as it exists to-day, and details the experience of a young colored physician who, after graduating from foreign universities, returns to his birthplace to practice, and finds many of the commonest courtesies among physicians denied to him. Another story, of lighter calibre, which throws some light upon existing conditions in the South is *Eastover Courthouse*, written in collaboration by the two young southerners, Kenneth Brown and Henry B. Boone.

Two stories of New England life deserve to be emphasized for their delicate and unpretentious workmanship and their fidelity to life. The first is Miss Wilkins's *Portion of Labor*, a conscientious and minute study of life in a factory town, obviously based upon original research among living "human documents." The second is Anna Fuller's *Katherine Day*, a lengthy chronicle of a well-to-do New England family, beginning in the good old-fashioned way with the childhood of the heroine. There is such an unmistakable atmosphere of home life about the scenes and daily happenings that one feels convinced that the author imitated the example of Miss Alcott and drew freely from the experiences of her own life. Finally there is Arthur Stanwood Pier's story of Boston life, *The Sentimentalists*, depicting the social difficulties of a family from the west, with such a delicate appreciation of delicate gradations in the social scale as to have won for the author some flattering comparisons with the earlier work of Mr. Howells.

The colonial and other historical novels deserve to be treated quite apart from the rest of current fiction. In point of numbers, they very nearly keep pace with all the other volumes put together. From the commercial standpoint, they must out-

weigh them several times over. It is impossible to cover specifically more than a small proportion of these stories, and these only briefly. Taking them up as far as possible in chronological order, there is first of all Miss Johnston's new story, *Audrey*, which began running as a serial in the *Atlantic Monthly* during the closing months of the year, and had already progressed far enough to make it obvious that the interest of the story lay less in exciting adventures and the clash of swords than in a psychological study of a woman's heart. *Lasarre*, on the contrary, by Mary Hartwell Catherwood, is a straightforward story of adventure, based upon the tradition that the Dauphin of France, the son of Louis XVI., was smuggled to America and reared as the reputed son of a halfbreed Indian. Mrs. Catherwood writes with a degree of literary finish, while the cleverest element of the story lies in the manner in which the hero's identity with the French prince is never directly asserted, but merely suggested by circumstantial evidence. *Cardigan*, by Robert Chambers, is the first of a series of promised novels dealing with Indians, scouts, and breezy adventures. The scene is mainly the New York frontier, and the events cover the years from 1774 to the battle of Lexington. *The Backwoodsman*, by H. A. Stanley, is still another tale of the frontier during the Revolution, and is written frankly after the manner of Fenimore Cooper. Another Revolutionary story, which has been rather widely circulated, is *The Tory Lover*, by Miss Jewett. Its principal claim to popularity is based upon the presence of the popular hero, Paul Jones, as one of the leading characters. Irving Bacheller, whose earlier volume, *Eben Holden*, identified him with the so-called rural district school of fiction, has joined the ranks of historical novelists with a tale of the war of 1812, *D'ri and I*. Although the peaceful scenes of rural life are replaced by the clash of swords and the scream of exploding shells, the same appreciation of nature, the same tenderness and the same strain of homely wit that stamped the earlier volume also mark the pages of the later one. Several of the most popular books of the year deal with the period of the Civil War. Notable among them is *The Crisis*, by Winston Churchill, the heroine of which, Virginia, is the lineal descendant of the Richard Carvel of Mr. Churchill's earlier story. The scene of much of the book is St. Louis, just before and during the war, while Lincoln, Grant, and other prominent men of the period figure prominently in the story. While not less carefully written than *Richard Carvel*, there is on the whole less of an academic flavor, less bookishness, so to speak, about *The Crisis*. It seems as though, in getting nearer to his own times, Mr. Churchill unconsciously gained a greater freedom of expression, and his characters a correspondingly greater degree of vitality. *The Cavalier*, by Mr. Cable, is a story of the war as seen from the Confederate side, or rather, it is a delicate love story drawn upon a background of war days. In other words, he has not attempted to paint a broad, comprehensive picture of the struggle, but has simply confined himself to such incidents as directly concern the actors in the little romance he is telling, and leaves the reader to fill in the gaps for himself—an easy task for an imagination already stimulated by the vivid glimpses that he does give.

Our historical novelists have not confined themselves to American history. Worthy of mention are Marion Crawford's *Marietta*, a pleasant little tale of a Venetian glass-maker, in the days when Venice was a republic; *God Wills It*, a story of the first Crusade, by William Stearns Davis, who plainly shows the beneficial influence of *Richard Yea-and-Nay*, just as his earlier novel, *A Friend of Caesar*, showed the influence of Sienkiewicz; and lastly, *The Helmet of Navarre*, by Bertha Runkle, a rather remarkable *tour de force* when considered as the first effort of a young girl. Miss Runkle chose for her scene Paris, during the exciting days preceding Henry of Navarre's public profession of the Catholic religion. She has frankly taken Dumas for her model, and has studied him so faithfully that she tells a tale in which the rapidity of action is never once allowed to flag.

Poetry.—It has become the fashion of late to take a rather pessimistic view of English poetry, to speak slightly of minor poets, and because verse of the highest rank is rare, to overlook much which is of real promise. Yet a year which has given a metrical tragedy by Stephen Phillips, a volume of lyrics by William Ernest Henley, an epic by Sir Edwin Arnold, and collections of verse by Thomas Hardy and George Meredith, cannot be regarded as a fruitless year in verse. Mr. Phillips's new tragedy, *Herod*, different as it is in theme from his *Paolo and Francesca*, is obviously the product of the same definite conception of dramatic principles, showing the same tendency toward classicism of form, the same insistence upon a central fate motive, and, like the earlier play, abounding in passages of great lyric beauty. *Hawthorne and Lavender*, Mr. Henley's latest poems, well deserves the next place in a survey of the year's production in verse. One may not relish the pessimism, the carping spirit of Henley the critic, but it is difficult to resist the melody and the inspiration of Henley the singer. Sir Edwin Arnold's *Voyage of Ithoba* is a sort of African *Odyssey*, based upon a stray passage in Herodotus. It tells of strange wanderings among strange peoples, recorded in pleasant style and smoothly flowing verse. Yet the weight of opinion has pronounced it an ineffective and artificial pro-

duction, scarcely worthy of the author of *The Light of Asia*. In the words of an English critic, "A romance that begins with a museum and a mummy is not likely to impress us with a sense of living force." Mr. Meredith's new volume, *A Reading of Life*, has been received by his admirers with all their customary enthusiasm, an enthusiasm which those who stand outside the cult may share to a greater extent than usual, since these new poems are comparatively free from his characteristic obscurity of diction. Yet even his most lenient critics feel that at best the qualities of Mr. Meredith's poetry are essentially the qualities of his prose—subtle analysis, daring imagery, word and phrase strained to the limit. It is only now and then that a flash of inspiration lifts his poetry to the highest plane. Mr. Hardy's *Poems of the Past and the Present* offer an interesting contrast. They are the expression of a chronic pessimist, a disillusioned student of life. His attitude is obviously no pose, but a genuine condition of mind, and he has expressed it with lucidity and power. His absorption in his theme, however, seems to have left him little time for questions of mere form, and the lyric quality of his verse has suffered in proportion. An example of a poet to whom perfection of form is the highest goal is Mr. Richard Garnett, whose collection of sonnets, *The Queen and Other Poems*, gives proof of his easy mastery over this difficult form, which seems to attract him so irresistibly. William Vaughan Moody has displayed genuine poetic feeling and rare sympathetic charm in his *Poems and The Masque of Judgment*. The young English novelist and critic, Stephen Gwynn, attracted some attention by a volume of spirited verse, *The Queen's Chronicler*, the product of an inspiration obviously drawn largely from Byron, and not always from Byron at his best. Among the minor volumes of verse that offer more or less valid claims to notice should be mentioned *The Rose of Dawn*, by Helen Hay, a simple and graceful narrative in blank verse; *Johnny Courteau and Other Poems*, by W. H. Drummond, being a further collection of Canadian dialect verse after the fashion of *The Habitant*; *Weeds by the Wall*, by Madison Cawein, in which the good and the bad are pretty equally commingled; and *Songs of the North and South*, by Walter Malone. There is also a new volume by Edwin Markham, *Lincoln and Other Poems*, which does not seem likely either to augment or diminish the reputation of the author of *The Man with the Hoe*.

Belles Lettres.—To readers who share Mr. Howells's literary convictions, one of the most delightful books of the past year will naturally be *Heroines of Fiction*. In a series of essays covering English fiction from Miss Burney and Samuel Richardson down well-nigh to the present day, Mr. Howells has selected from each author certain favorite heroines, whom he has used as a starting point for an analysis which often extended beyond the particular heroine to a comprehensive criticism of the author. In a work of such a broad range it is inevitable that the reader should find many points on which he will not be wholly in accord with Mr. Howells; but that does not prevent these two volumes from being very interesting reading, as well as a useful clue to the author's literary tenets. In sharp contrast to the impressionistic criticism of Mr. Howells is the less exclusively subjective, and yet thoroughly original, method of Mr. W. C. Brownell, whose *Victorian Prose Masters* includes six of the most careful and well-balanced studies that have yet come from his pen. The subjects included are Thackeray, George Eliot, Carlyle, Matthew Arnold, Ruskin, and George Meredith. Matthew Arnold is also the subject of one of the thirteen essays which the English critic, Mr. Herbert Paul, has reprinted from the *Nineteenth Century*, under the title, *Men and Letters*. They are praised for their comprehensive point of view and the suggestive manner in which the material is presented. *Essays of an Ex-Librarian*, by Richard Garnett, is a welcome volume, although part of the contents is already familiar, in the form of magazine articles, or, as in the case of the essay on Thomas Love Peacock, having served as a preface of an edition of that author. The table of contents is a good proof of Dr. Garnett's catholic taste in literature, since we find, among other subjects, essays on Homer, Beckford's *Vathek*, Lord Beaconsfield, Shelley, Luigi Tansillo, and Ralph Waldo Emerson. *Poets of the Younger Generation*, by William Archer, gives estimates of no less than thirty-three of the younger poets of to-day, including Kipling, Richard Le Gallienne, Stephen Phillips, etc. One English critic pronounced it "a treasure-house of well-argued criticism, no less than a collection of much admirable and some little-known poetry." Professor George Saintsbury has shown himself unusually industrious, since he has not only added a new volume, *The Earlier Renaissance*, to the well-known and useful little series of *Periods of European Literature*, of which he is editor, but he has also found time to complete the first part of a comprehensive and ambitious work, *The History of Criticism and Literary Taste in Europe from the Earliest Times to the Present Day*. The initial volume covers the classical and post-classical periods, stopping short of the Renaissance in Italy.

Biography and Memoirs.—The past year has been marked by an unusual number of thoughtful and interesting biographies. They include, to begin with, several important lives of men prominent in the world of letters—Mr. Balfour's *Stevenson*,

Mr. Scudder's *Lowell*, Slason Thompson's *Eugene Field*, the *Letters of Green*, the historian, and a *Life of Gilbert White* of Selborne, by his great-grand-nephew, to mention only the more important. Then, too, there has been more than the usual average of royal biographies, the list being swelled on one side by the occasion of the millennial of Alfred the Great, which called forth a substantial number of monographs, and on the other by the death of Queen Victoria, which hastened the publication of numerous more or less hastily written lives, besides the authoritative one by the Marquis of Lorne. Taking them up in chronological order, we may note among the *Alfrediana*, a posthumous volume by Sir Walter Besant, *The Story of Alfred*, which, with the exception of the volume of specialist essays edited by Mr. Alfred Bowker, is the best and most readable of all the works on the subject which the celebration has called forth; *Alfred the Great; His Life and Time*, by G. F. Bosworth; *Alfred the West Saxon King of England*, by Douglas Macfayden, published in the "Saintly Lives Series"; and *The Story of Alfred the Great*, a convenient little volume, written confessedly for the use of "the general reader who has no time for research." There is a biography of Mary, Queen of England, by J. M. Stone, commended by some critics as the best history of Mary and her times that has yet appeared; another on Queen Elizabeth, by the Rt. Hon. Mandell Creighton; and several volumes upon Mary, Queen of Scots, of which the most notable is *The Mystery of Mary Stuart*, by Andrew Lang. The purpose of Mr. Lang's book is neither to present a formal biography nor to solve the question of Mary Stuart's guilt or innocence, but merely to show "how the whole problem is affected by the discovery of the Lennox Papers, which admit us behind the scenes and enable us to see how Mary's persecutors got up their case." He has succeeded in handling a great mass of dry, detailed, and confusing documents in his customary light, lucid, and readable manner, and, if he has not permanently closed the discussion, has at least thrown fresh light upon many points and suggested some plausible theories to explain many puzzling actions. Mr. Osmond Airy has provided the text for a sumptuous volume on Charles II., the rich illustrations of which make it of more importance as an art book than a historical work. Nevertheless, without being a history of England under Charles II., it is a serious and comprehensive presentation of the life of the Merry Monarch, told in an entertaining fashion. Of the numerous volumes that have appeared relating to the life of the late Queen, that by her son-in-law, the Marquis of Lorne (the Duke of Argyll), possesses the special interest which comes from the author's peculiar opportunities for information. So far as it goes, it is a satisfactory volume, giving the intimate history of the life and reign of Queen Victoria, as fully and with as little impartiality as could reasonably be expected from such a source. *The Childhood of Queen Victoria*, by Mrs. Gerald Gurney, has less claim to distinction. It is, however, in a certain sense timely, and is modestly put forward by the author as a work of love. An instance of almost journalistic promptness on the part of author and publisher is *The Private Life of Edward VII.*, which appeared shortly after the king's accession, and purports to have been written by some member of the royal household.

There are just a few biographies of titled personages this year that for one reason or another deserve inclusion here. One of these is *King Monmouth*, by Allan Fea, whose researches in seventeenth-century history have borne fruit in this comprehensive account of the ill-fated Duke of Monmouth, whom Charles II. recognized as his natural son, and whom not a few Englishmen would have been glad to see legitimized, and so become heir to the throne. The volume shows evidence of indefatigable industry, but is criticised for its lack of historical method. *Bolingbroke and His Times*, by Walter Sichel, plunges us into the network of intrigue which characterized the closing years of Queen Anne's reign and the beginning of that of George I. The interest of the book lies in Mr. Sichel's novel point of view, for he seems to assume that all preceding historians have been too deeply imbued with Whig principles to do justice to such a Tory as Bolingbroke. Another notable figure of the age of Anne was Sarah, Duchess of Marlborough, wife of the victor of Blenheim. The story of her life, her friendship with the Queen, her ungovernable temper, and her marriage with the foremost military leader of the period, has been told by many pens and from many different points of view. But that does not prevent it from making her latest biography, *The Queen's Comrade*, very interesting reading at the hands of one so expert in the art of biographical gossip as its author, Mr. Fitzgerald Molloy. Two articles upon the Duke of Brunswick, by Lord Edmond Fitzmaurice, which appeared originally in the *Edinburgh Review*, have been reprinted in the form of a small volume—a degree of permanence which their merit seems to have deserved.

Aside from the brief but readable little monographs appearing from time to time in the rival series of "Beacon Biographies" and "Riverside Biographies," there are comparatively few volumes this season devoted to the lives of American statesmen. Noteworthy among the exceptions is Norman Hapgood's *George Washington*, which

follows with a somewhat more assured touch the method of the same author's earlier volume on Abraham Lincoln. Mr. Hapgood has not sought to give a comprehensive study of the public career of Washington, the battles that he fought, or the details of his administrations. What he does seek to do is to draw from the recorded facts a comprehensive and vivid picture of Washington's personality, viewed not as a general or a president, but simply as a fellow human being; and it is his success in this direction which gives the volume its permanent interest. *The True Thomas Jefferson*, by William Eleroy Curtis, is an attempt along radically different lines to do a somewhat analogous service to Jefferson. It is not a formal biography, but simply a collection of the important facts in Jefferson's life, classified under such headings as "Jefferson as a Lawyer," "Jefferson as a Farmer," and the like. It is written in a prevailing tone of fairness, is distinctly entertaining, and valuable for the material which it makes readily accessible.

Mr. Horace Scudder's two-volume life of *James Russell Lowell* is a biography which has been awaited with pleasurable expectations, for it was felt to have been intrusted to safe hands. The result justifies the choice, since every page bears testimony to the writer's close friendship, intimate knowledge and sympathetic understanding of his subject. The chief criticism that has been made is that the book is unnecessarily expanded; the incidents of Lowell's life, especially of the earlier years, seem hardly to warrant their expansion to the limits of the two volumes which had been planned. Yet if certain portions seem over-elaborate when the volume is first read in its entirety, it would be difficult to indicate any details which one would be willing to omit from it when regarded as a permanent record and book of reference. Of even more widespread interest is the long-awaited *Life of Robert Louis Stevenson*, by Graham Balfour, the life which was originally to have been written by Mr. Sidney Colvin, the editor of Stevenson's *Letters*. It is interesting to note with what unanimity the reviewers, even those most cordial toward Mr. Balfour's work, have expressed the wish that the *Life* and the *Letters* might have been intrusted to a single hand, and thus welded into a single well-rounded and comprehensive work. It is obvious that the prior publication of the *Letters* somewhat handicapped Mr. Balfour, since even the most enthusiastic votary of Stevenson feels that this later work has not brought him materially nearer. Nevertheless, there is a good deal of new matter in these two volumes. Stevenson's childhood is expanded into a most detailed and minute survey, while Mr. Balfour's special qualification for his task—the fact that he was a close companion of Stevenson in his island home during the closing years—has enabled him to treat this period with a fullness which makes the volume an indispensable commentary upon the later portion of Stevenson's published letters. A second and briefer biography of Stevenson has appeared within the year, written by H. Bellyse Baildon, and containing some interesting criticisms of personal and literary characteristics. In this connection should be mentioned a capital little monograph by Professor John Franklin Genung upon *Stevenson's Attitude to Life*, in which his philosophy is summed up as being "not to ponder upon life, but to live." A writer who in one gift, at least, that of writing child-verse, came very near to Stevenson, was Eugene Field, whose biography has been written in elaborate fashion by Mr. Slason Thompson. It is sub-titled, "A Study in Heredity and Contradictions," and while the first claim of this title is scarcely vindicated in the chapters devoted to Field's antecedents, that relating to contradictions is amply fulfilled, for a more thoroughly inconsistent man it has probably never been the lot of a biographer to portray.

Two autobiographies which offer a sharp contrast to each other are *The Making of an American*, by Jacob Riis, and *The Autobiography of a Journalist*, by W. J. Stillman. Mr. Riis's record of his upward struggle is a straightforward, unvarnished tale, tinged here and there with a naïve and unconscious egotism, and full of the interest which comes from picturesque phases of life in unfamiliar social strata. It is the work of a man still comparatively young, and is full of the stimulating contagion of Mr. Riis's exuberant energy. Mr. Stillman looks back over a varied career of seventy years, and although his, too, is a story of a steady rise in the world, the surroundings were very different, including consulships at Rome and Crete, and twenty-five years of service as correspondent for the *London Times*. The volume was written in the hope "that a human document in which the development of a mind from the archaic condition of New England Puritanism to freedom of thought was honestly and unreservedly told, might be worth doing." Undoubtedly, however, the most remarkable autobiography of the year, and the most remarkable one that has appeared for several years, was *Up from Slavery*, by Mr. Booker T. Washington, president of the Tuskegee (Ala.) Institute. This book traces the development of a fatherless, ignorant slave child to a scholar and man of affairs. It is striking for its simplicity, its pathos, and its veiled power.

It is more than a century since White of Selborne died, yet he has had to wait until the past year for a biographer. It is obvious, however, that the publication of

such a work is justified, since new editions of the *Natural History of Selborne* have multiplied rapidly of late, and in the person of his descendant, Rashly Holt White, the naturalist seems to have found a sympathetic, conscientious, and diligent chronicler. A contemporary and near neighbor of Gilbert White, Jane Austen, has, on the contrary, been written up to such an extent that one wonders that there still remains scope for a new volume. Yet in *Jane Austen: Her Homes and Her Friends*, Constant Hill has not only unearthed a fair amount of new matter in the course of a pious pilgrimage to Austen-land, but has ingeniously arranged much of the old, familiar matter contained in Miss Austen's own writings, so that they shed fresh light upon themselves.

It is impossible to consider in detail the rest of the numerous biographies which deserve at least some mention. Two more volumes have been added to *The Story of My Life*, by Augustus J. C. Hare, so widely known for his *Walks in Rome, Florence*, and other Continental cities. There are some interesting memoirs of cultured Englishwomen, such as the *Life and Letters of Lady Sarah Lennox*, and *South Africa a Century Ago*, by Lady Anne Barnard, who is remembered as author of *Auld Robin Gray*. There are monographs on *François de Fénelon*, by Viscount St. Cyres, of Christ Church, and *Fénelon: His Friends and Enemies*, by E. K. Saunders; and there is an exhaustive study of a still earlier ecclesiast, Peter Abélard, by Joseph McCabe. Tolstoy is studied by Aylmer Maude in nine essays, collected under the title, *Tolstoy and His Problems*; and by B. H. Perris, in a work called *The Life and Teachings of Leo Tolstoy*. Lives of artists included one upon Hubert von Herkomer, by A. L. Baldry, and a highly eulogistic account of *William Hamilton Gibson, Artist, Naturalist, Author*, by John Coleman Adams. Finally, there are two volumes of stage reminiscences contributed respectively by two well-known American actresses, Mrs. Gilbert and Clara Morris.

Publication.—In Great Britain 6,044 books were published in 1901, of which 4,955 were new books, and 1,089 new editions. The following table shows by classes the total number of books published in the United States during 1900 and 1901:

CLASSES.	1900.		1901.	
	New books.	New editions.	New books.	New editions.
Fiction.....	616	662	914	1,320
Literature and Collected Works.....	187	356	297	429
Juvenile.....	482	45	434	161
Education.....	431	210	529	31
Law.....	513	30	480	60
Theology and Religion.....	411	37	476	57
Poetry and Drama.....	192	208	274	174
Biography, Correspondence.....	225	49	340	88
Medicine, Hygiene.....	146	72	186	106
Physical and Mathematical Sciences.....	160	24	260	42
History.....	221	36	264	19
Political and Social Science.....	258	11	244	13
Description, Geography, Travel.....	180	42	202	18
Fine Arts: Illustrated Gift Books.....	145	22	187	59
Useful Arts.....	122	31	180	37
Philosophy.....	91	7	96	18
Sports and Amusements.....	44	7	64	6
Domestic and Rural.....	64	12	87	8
Humor and Satire.....	32	2	42	4
Works of Reference.....	...	...	30	1
Totals.....	4,490	1,866	5,496	2,645
		4,490		5,496
		6,356		8,141

LITHIUM. There has been a considerable demand in the last few years for lithium minerals for use in the manufacture of lithium carbonate. The two minerals which have usually served as sources of the element are lepidolite and spodumene, both being complex silicates containing lithium. The largest deposits of the former in the United States are found near Pala, San Diego County, Cal. Spodumene occurs in some quantities in the Black Hills of South Dakota, and in Connecticut and Massachusetts, but while these occurrences have not been worked to supply lithium, still they may become producers in the future. The California lepidolite was mined to some extent in 1900, and it was expected that large shipments would be made in 1901. The separation of lithium from the mineral containing it is usually done by fusion with the carbonate and sulphate, whereby the lithium is converted into a sulphate. It is then dissolved and converted into a chloride, and from this

into the carbonate. Most of the lithium carbonates now used are manufactured in Germany, and nearly all of the American ore has been shipped to that country. It is there manufactured into the carbonate, which is then shipped back to the United States and sells for \$4.20 a pound in New York. Recently an American process has been developed by which lithium is obtained from spodumene. Lithium salts are extensively used in the arts, their chief use being in the preparation of mineral waters.

LITHOGRAPHIC LIMESTONE. The production of lithographic limestone in the United States in 1900 was small, and came from Brandenburg, Ky., where there is quarried a stone which is nearly equal in quality to that obtained from Bavaria. The latter continues to be the chief source of production, and the imports of 1900 had a value of \$94,134. A variety of onyx quarried near Salt Lake, Utah, is being tried as a substitute for lithographic limestone in dry printing, and is said to answer for this purpose. Plates of zinc and of aluminum, especially the latter, form still another substitute and seem to give satisfaction. While their introduction is recent, their effect on the market is noticeable.

LITTLEJOHN, Rt. Rev. ABRAM NEWKIRK, Protestant Episcopal bishop of Long Island, died at Williamstown, Mass., August 3, 1901. He was born at Florida, N. Y., December 13, 1824, and graduated at Union College in 1845. After a three years' course in theology he was ordained a deacon in 1848 and went to Amsterdam, N. Y., as assistant at St. Anne's, and in 1850 was called to Springfield, Mass., as rector of Christ Church. He left there a year later to take charge of St. Paul's, at New Haven, Conn., and during his ten years' incumbency made himself widely known in the religious world by his writings. From New Haven he went to Brooklyn, N. Y., to be rector of Holy Trinity Church, and during his nine years of service he freed the church from debt and completed it. He was consecrated bishop of Long Island in 1869, and for a time after 1874 was in charge of the American Protestant Episcopal churches in Europe. Of Bishop Littlejohn's published works may be mentioned: *Conciones ad Clerum* (1879); *Individualism: Its Growth and Tendencies* (1881); and *The Christian Ministry at the Close of the Nineteenth Century* (1884).

LIVER. Cases multiplied during 1901 of the operation of epiploexy. In cirrhosis of the liver, when the second stage is reached, the viscus contracts, occluding the veins through which practically all the blood in the body must pass on its way to the heart. This interference causes dilatation of the veins leading to the liver and the transudation of the fluid part of the blood through the walls of the blood vessels in the direction of least resistance. Hence the dropsy of the lower extremities and the accumulation of the serum in the abdominal cavity, producing the condition known as ascites. Under great pressure from below only the thickest part of the blood is forced through the veins of the liver. To relieve this state of affairs temporarily, the operation of epiploexy was devised. It consists in suturing the omentum (epiploön) to a denuded strip of the parietal surface of the peritoneum, thus establishing a collateral circulation. The pathological process in the liver is in no degree influenced by the operation. See *Philadelphia Medical Journal*, January 26, 1901, and *Medical Record*, New York, March 23, 1901.

LIVE STOCK. See AGRICULTURE and DAIRYING.

LLOYD, JOHN URI, American novelist, whose latest story *Wartwick of the Knobs*, was published serially in 1901, was born at Bloomfield, N. Y., April 19, 1849, and was educated in the schools of Kentucky, studying successively at Florence, Burlington, and Petersburg. As a chemist and writer on pharmaceutical subjects, Mr. Lloyd had won a recognized position before he turned to fiction, and his publications on these subjects include *The Chemistry of Medicine* (1881); *Pharmaceutical Preparations and Elixirs, their History, Formula, and Methods of Preparation* (1883); and *A Study in Pharmacy*, besides many separate articles on pharmacy and allied subjects. The first of his novels to attract notice was *Stringtown on the Pike* (1900), though he had published besides, *Etidorhpa* and *The Right Side of the Car*. His best work has to do with the primitive Kentucky mountain settlements, of which he writes with a sympathetic humor.

LODGING HOUSES, MUNICIPAL. See MUNICIPAL LODGING HOUSES.

LOEB, JACQUES. See BIOLOGY and PHYSIOLOGY, CHEMICAL.

LOUISE, PRINCESS OF PRUSSIA, died at Wiesbaden, May 10, 1901. She was born in March, 1829, and was married in 1854 to Prince Alexis, of Hesse-Philippsthal-Barchfeld. Princess Louise was a sister of the late Prince Frederick Charles Nicholas of Prussia, and a niece of Emperor William I.

LOUISIANA, a Gulf State of the United States, has an area of 48,720 square miles. The capital is Baton Rouge. Louisiana was admitted as a State, April 30, 1812. The population in 1900 was 1,381,625, while in June, 1901, as estimated by the

government actuary, it was 1,411,000. The two largest cities in 1900 were: New Orleans, 287,104, and Shreveport, 16,013.

Finance.—The receipts of the treasury for the year ending December 31, 1901, were \$3,892,308.27; there was a balance on hand January 1, 1901, of \$1,305,691.64. The expenditures for the year were \$3,775,567.75, leaving a balance at the end of the year of \$1,422,432.16. The State debt, unchanged during the year, on December 31, 1901, amounted to \$10,877,800, all bonded. The State tax rate for 1901 was 6 mills per \$1, while the total value of State property, as returned for taxation, was \$301,215,222.

Industries.—Although Louisiana is an agricultural State, the *Census Reports* of 1900 show that manufacturing industries have largely increased since 1850. In the intervening time the population increased from 517,762 to 1,381,625, or 166.8 per cent., while the average number of wage-earners increased from 6,217 to 42,210, or 578.9 per cent., embracing, in 1900, 3.1 per cent. of the entire population. The amount of actual capital invested in 1900 in mechanical industries, exclusive of capital stock, was \$113,084,294, the gross value of the products were \$121,181,683, while the net value, exclusive of products re-used in the process of manufacture, was \$69,770,373. The manufactures of Louisiana depend closely upon its natural resources; upon its forests, which cover three-fourths of the State's area, and upon its sugar-cane, cotton, and rice fields. The refining of sugar is the most important industry of the State, the product in 1900 being valued at \$47,891,691, or 39.5 per cent. of the total value of the products of the State. A serious obstacle to the increase of this industry has hitherto been the enforced idleness of the plants during the greater part of the year; but an allied industry now being developed, that of the manufacture of paper from the woody fibre of the sugar-cane, promises to remove this difficulty. The manufacture of cottonseed oil and cake holds third place among the industries of the State, the product in 1900 being valued at \$7,026,452, an increase of 346.5 per cent. since 1890. The facilities offered at the port of New Orleans for distributing this product have done much to aid this industry. Among other industries are that of cleaning and polishing rice, whose products in 1900 were valued at \$5,736,451, and that of manufacturing burlaps and other coarse cloth bags for the handling of cottonseed, fertilizers, etc. The latter industry, strictly subsidiary to and dependent upon other industries has increased 414 per cent. during the decade from 1890, its products in 1900 being valued at \$2,773,523. In general industrial development Louisiana has been retarded by the high price of fuel; but the completion of some improvements of the Warrior River in Alabama and the opening of a canal connecting the Mississippi River with the Gulf of Mexico through Lake Borgne, have now insured through-water rates for coal from the nearest mines, while at the same time the discovery of oil in Texas and Louisiana has furnished a cheap substitute for coal.

Forests and Forest Products.—The manufacture of lumber and timber products ranks second in importance among the industries of the State, the products being valued in 1900 at \$17,408,513, representing an increase of 203 per cent. during the decade. While in 1890 the production was almost exclusively confined to yellow pine lumber, in 1900 cypress and hardwood products figured to a considerable extent. Nevertheless, the valuable cypress forests of the State are practically untouched and extensive preparations are now being made for their exploitation. Longleaf pine covers yet a wide area in Louisiana. "South of the Red River bottoms these forests continue unbroken to the Sabine River, and to the treeless savannas of the coast in Calcasieu parish, their eastern boundary."

State Officers.—Governor, William W. Heard, Democrat, elected for four years, term expiring April, 1904; lieutenant-governor, Albert Estopinal; secretary of state, John T. Michel; auditor, W. S. Frazee; treasurer, Le Doux E. Smith; attorney-general, Walter Guion; superintendent of public instruction, J. V. Calhoun; land commissioner, James M. Smith. Supreme Court: Chief justice, Francis T. Nichols, term twelve years, to expire May, 1904; associate justices, Joseph A. Breaux, Newton C. Blanchard, Frank A. Monroe, and Olivier O. Provoshy—all Democrats.

Congressional Representatives (57th Congress).—In the House: Adolph Meyer, from New Orleans; Robert C. Davey, from New Orleans; Robert F. Broussard, from New Iberia; Phanor Breazeale, from Natchitoches; Joseph E. Ransdell, from Lake Providence, and Samuel M. Robertson, from Baton Rouge—all Democrats. In the Senate: Samuel D. McEnery, from New Orleans, elected for the term ending in 1903, and reelected for the term ending in 1909, and Murphy J. Foster, from New Orleans, elected for the term ending in 1907—both Democrats.

LOUISIANA PURCHASE EXPOSITION. It is proposed to celebrate the centennial anniversary of the purchase of Louisiana territory by the United States on April 30, 1803, by an international exposition, to be held at St. Louis, Mo., from May 1 to December 1, 1903. Accordingly, a Louisiana Purchase Exposition Company, with a capital stock of \$6,000,000, was organized on May 3, 1901, with Mr.

David R. Francis as president, Mr. William H. Thompson as treasurer, and Mr. Walter B. Stevens as secretary, and eight vice-presidents and a number of directors chosen from among the representative citizens of St. Louis. Subsequently twenty-five committees were appointed, each to take charge of some special department of exposition work. This corporation raised \$5,000,000 by popular subscription, and then secured a subscription of \$5,000,000 from the city of St. Louis, and a like amount from the United States government. The Exposition has for its purpose the exhibition of the arts and industries, the methods and processes of manufacture, and the products of the soil, mine, forest, and sea of the world. It will illustrate both material and social advancement. It will also show modern methods of recreation, and it will illustrate the modern home with the many comforts and conveniences that have been brought into common use within the century. It will present a comprehensive anthropological exhibition, showing particularly the barbarous and semi-barbarous peoples of the world as nearly as possible in their ordinary and native environments. The principal sections into which the exhibit will be divided are as follows: (a) Education, (b) Art, (c) Liberal Arts, (d) Manufactures, (e) Machinery, (f) Electricity, (g) Transportation, (h) Agriculture, (i) Horticulture, (k) Forestry, (l) Mines and Metallurgy, (m) Fish and Game, (n) Anthropology, (o) Social Economy, and (p) Physical Culture. The staff thus far chosen consists of Frederick J. V. Skiff, director of exhibits; Edward J. Rogers, chief of education; Halsey C. Ives, chief of art; John A. Ockerson, chief of liberal arts; Milan A. Hulbert, chief of manufactures; Thomas M. Moore, chief of machinery; W. Elwell Goldsborough, chief of electricity; Frederic J. Taylor, chief of agriculture; David T. Day, chief of mines and metallurgy; and Tarleton H. Bean, chief of fish and game.

A site, consisting of 668 acres of Forest Park, with some 400 acres of adjoining property in St. Louis was selected, where on December 20, 1901, the ninety-eighth anniversary of the formal transfer of the Louisiana territory to the United States, ground was broken for the beginning of the Exposition. It is expected that more than \$30,000,000 will be expended on the Exposition, and plans for buildings, to cost about \$7,000,000, have already been adopted, as follows: Agricultural Building, 700 by 2,000 feet, covering 32.14 acres, costing \$800,000; Art Building, 300 by 900 feet, 6.19 acres, costing \$1,000,000; two Art Pavilions, each 200 by 300 feet, 2.75 acres; Liberal Arts, 600 by 525 feet, 7.25 acres, costing \$375,000; Manufactures and Liberal Arts, 525 by 1,200 feet, 14.46 acres, costing \$845,000; Electricity Building, 600 by 525 feet, 7.25 acres, costing \$400,000; Mines and Metallurgy, 525 by 1,200 feet, 14.46 acres, costing \$760,000; Education, 525 by 750 feet, 9.04 acres, costing \$500,000; Social Economy, 525 by 750 feet, 9.04 acres, costing \$460,000; Transportation, 525 by 800 feet, 9.61 acres, costing \$660,000; Machinery, 525 by 1,000 feet, 12.05 acres, costing \$700,000; Government Building, 400 by 250 feet, 2.29 acres, costing \$250,000; and Ordnance and Fisheries Pavilions. Also a great many other buildings will be erected for State, territorial, and foreign exhibits. A national commission consisting of Thomas H. Carter, of Montana, president; Martin H. Glynn, of New York, vice-president; John M. Thurston, of Nebraska; William Lindsay, of Kentucky; George W. McBride, of Oregon; Frederic A. Betts, of Connecticut; John M. Allen, of Mississippi; John F. Miller, of Indiana; Philip D. Scott, of Arkansas; and secretary, Joseph Flory, was appointed by President McKinley. Also a government board, to have charge of the collection, arrangement, and maintenance of exhibits, has been appointed, as follows: J. H. Brigham, chairman, Department of Agriculture; W. H. Michael, Department of State; Wallace H. Hills, Treasury Department; J. C. Scofield, War Department; Frank Strong, Department of Justice; John B. Brownlow, Post-Office Department; B. F. Peters, Navy Department; Edward M. Dawson, Department of Interior; Frederick W. True, Smithsonian Institution; W. de C. Ravenel, Commission of Fish and Fisheries; G. W. W. Hanger, Department of Labor; Williams C. Fox, Bureau of American Republics; W. V. Cox, secretary; and William M. Geddes, disbursing officer. The *World's Fair Bulletin* is published monthly in St. Louis in the interests of the Exposition, in which its progress is regularly described.

LOW, SETH, former president of Columbia University, was elected mayor of New York City, November 5, 1901, as the candidate of the fusion forces opposing Tammany Hall. Mr. Low had previously, upon receiving the nomination for mayor, resigned from the presidency of Columbia, a position he had held since 1890. He was born in Brooklyn, N. Y., January 18, 1850, and graduated at Columbia in 1870. After studying law for a time, he entered his father's tea-importing establishment, and later became a member of the firm. From 1881 to 1885 he served as mayor of Brooklyn, having been elected as an independent, and conducted an administration marked by unusual ability and integrity. As president of Columbia he was largely responsible for the institution's great growth and its change in character from a college to a university. In 1895 he presented to the institution a magnificent new

library building, costing about \$1,000,000. He was the Citizens' Union candidate for first mayor of the Greater New York (1897), but was defeated by Robert A. Van Wyck, the Tammany nominee. Mr. Low is president of the Geographical Society of New York and the New York Academy of Political Science, and vice-president of the New York Academy of Sciences.

LUBY, THOMAS CLARKE, Fenian agitator, died at Jersey City, N. J., November 30, 1901. He was born at Dublin, Ireland, January 15, 1822, and was educated at Trinity College there. Though he studied law, Mr. Luby never practiced, but took up journalism, and in 1864 became managing editor of *The Irish People*, founded by James Stephens (q.v.). This paper, under the complete control of the leaders of the Fenian movement, had an important bearing upon the development of a revolutionary spirit in Ireland, and was suppressed by the British government in 1865. Mr. Luby was arrested, convicted of treason, and sentenced to twenty years' imprisonment; but after serving a little more than five years was released on condition of remaining away from Ireland. He went to New York City soon after, where he continued the agitation for Irish independence. Mr. Luby published *The Life of Daniel O'Connell* and *The Lives and Times of Illustrious and Representative Irishmen* (1878).

LUDLOW, General **WILLIAM**, brigadier-general, U. S. A., died at Morristown, N. J., August 30, 1901. He was born at Islip, Long Island, November 27, 1843, and graduated at West Point in 1864. Commissioned a first lieutenant upon graduation, he was assigned to duty as chief engineer of the Twentieth Army Corps, and was soon after brevetted captain for gallantry in action at the battle of Peach Tree Creek. As chief engineer of the left wing of Sherman's army he made the "march to the sea" in 1864-65, and was brevetted major and then lieutenant-colonel for gallantry. In 1867 he was commissioned a captain in the regular army, in the engineer corps, and in 1872 he was placed in command of the department of the Dakota, where he remained until 1876. He served, with government consent, as chief engineer of the Philadelphia water department from 1883 to 1886, revolutionizing the city's system, and in various places as government engineer in charge of lighthouses and river and harbor work, until he was sent to London (1893) as military attaché of the American embassy. In 1895 General Ludlow reported on the Nicaragua Canal project. At the outbreak of the Spanish-American War he was made a brigadier-general of volunteers and assigned to General Shafter's army, his brigade doing especially valuable work at the battle of El Caney. After peace was declared he was appointed military governor of Havana and was commissioned a brigadier-general in the regular army. On being relieved of duty in Cuba he was sent abroad to study foreign military institutions and prepare a plan for a United States war college, his report on which is now on file in the War Department. General Ludlow was sent in 1900 to the Philippines to succeed General Hughes in command of the southern islands, but developed tuberculosis and was invalided home early in 1901.

LUGGER, **OTTO**, State entomologist of Minnesota, died May 21, 1901. He was born at Hagen, Germany, where he was educated, and served in the Prussian army as lieutenant of cavalry. Coming to the United States in 1865, he was employed for several years as an engineer on the survey of the Great Lakes, at the same time pursuing private studies in natural history. In 1868 he became assistant to Professor C. V. Riley, the State entomologist of Missouri, and in 1875 curator of the Maryland Academy of Sciences and naturalist of city parks in Baltimore. He joined the division of entomology of the United States Department of Agriculture in 1885, and three years later became entomologist to the Minnesota State Agricultural Experiment Station. While serving in this capacity he was successful in overcoming a threatened invasion of Rocky Mountain locusts or western migratory grasshoppers, which were then doing great damage in the western States. Mr. Lugger was the author of many papers and reports on various insects, and was considered one of the leading entomologists of the United States.

LUPUS. See **PHOTOTHERAPY**.

LUTHERAN CHURCH IN THE UNITED STATES dates its inception as an organization from the establishment, in 1748, of the first synod or ministerium, that of Pennsylvania. It has (1901), included in the four general bodies and fifteen independent synods, comprising 62 synods in all, 6,914 ministers, 11,425 congregations, and 1,705,185 communicants; 5,725 Sunday schools, with 52,601 officers and teachers, and 570,129 scholars; and 4,034 parochial schools, with 190,095 pupils. The aggregate in contributions for the year equaled \$1,185,959. There are throughout the world over 58,000,000 baptized members in the Lutheran Church, Germany alone having over 31,000,000. As a whole, the Lutherans control in this country 23 theological seminaries, with 88 professors and 954 students; 48 colleges, with 466 professors and 7,901 students; 31 academies and 11 ladies' seminaries; 18 hospitals, with 6,646 inmates; 43 orphan homes, with 2,547 inmates; 17 homes for the aged,

asylums, etc., with 634 inmates; 11 immigrant and seamen's missions, with 10,885 inmates; and 8 deaconess institutions, with 4,920 inmates. A large number of periodicals are published, the majority in the English and German languages, but a considerable number also in Norwegian, Swedish, Danish, Icelandic, Finnish, French, Slavonian, Lettish, and Esthonian.

The *General Synod*, organized in 1821, the oldest general body of Lutherans in America, has 198,575 communicant members, with 1,210 ministers and 1,561 congregations, and 1,514 Sunday schools, attended by 195,137 scholars. The contributions of this body, which is composed mainly of English adherents, amounted to \$312,128. The *General Council*, made up of English, German, and Scandinavian ministers and congregations, and organized in 1867, is now represented by 1,306 ministers, 2,068 congregations, and 362,409 members. Its Sunday schools, 1,733 in number, enroll 213,019 scholars. Total contributions were \$278,469. The *Synodical Conference*, dating from 1872, an almost exclusively German division, numbers 590,987 communicants, with 2,079 ministers and 3,755 congregations, and has 619 Sunday schools, with a membership of 27,950, its parochial institutions in number and attendance far exceeding its Sabbath schools. The contributions of this body aggregated \$228,529. The *United Synod of the South*, organized in 1886 and practically embracing an exclusively English constituency, claims 206 ministers, 405 congregations, and 37,958 members, and 350 Sunday schools, with an attendance of 21,212 scholars. Its contributions equaled \$24,982. The independent synods (German, Norwegian, Danish, Icelandic, and Finnish in nationality) have 2,113 ministers, 4,636 congregations, and 515,256 communicant members, 1,309 Sunday schools, and 112,911 scholars. Their offerings reached a total of \$341,850.

The *General Synod* held its fortieth biennial convention May 29-June 6 at Des Moines, Ia. The meeting, at which the 24 district synods were represented by nearly 350 clerical and lay delegates, heard reports from the foreign missionary fields, that of India being notably encouraging; also from the home missionary work, now including 20 States and Territories, noting Lutheran gains in large cities, and particularly outside of New England. The body reaffirmed its entire adherence to the prevailing doctrinal standards and cordially received the delegate from the Lutheran General Council, who laid before the assembly proposals of cooperation, thus marking a step toward Lutheran unification. The General Synod in 1903 will meet in Baltimore. At the twenty-eighth convention of the *General Council*, in session October 10-15 at Lima, O., 10 synods were represented by 7 clerical and 49 lay delegates. A feature of the meeting was the presence of Rt. Rev. Gezelius von Schüle, bishop of Visby, Sweden, the official representative of the crown at the Yale bi-centennial and to the Swedish Lutherans in the United States. The missionary work of this body in India now includes 7 principal stations and 330 out-stations, with 5 ordained missionaries and 150 other workers, while the field in Porto Rico, established in 1900, has 2 stations, with churches and Sunday schools, and 2 missionaries and 1 teacher. Home missions are located in 40 States and Territories and in the Dominion of Canada. A new synod, that of the Pacific, was erected in 1901 as a result of the progressive work of this department in the Northwest. Other important matters before the assembly were in regard to the adoption of a uniform translation of Luther's *Catechism* and *Ministerial Acts* to supplement the "Common Service," and the substitution of a graded series of Bible lessons for the International Lessons in Sunday-school work. The convention of 1903 will be held at Mansfield, O.

LUTHER LEAGUE OF AMERICA, organized in 1895 in Pittsburg, Pa., for the purpose of training the younger church members for more active and efficient service in the church. It has State leagues throughout the country, organized into 43 district and 870 local leagues, which include a membership of about 40,000. Biennial national conventions are held, the next of which takes place in 1902. The order publishes the *Luther League Review* at Washington, D. C., E. F. Eilert, editor.

LUXEMBURG, an independent grand duchy of Europe, bounded by Germany, Belgium, and France. It has an area of 998 square miles, and a population (1900) of 236,543. Luxemburg, the capital, has a population of 30,000. Of the foreign-born population of the duchy 14,603 are German, 7,465 Italian, 1,891 Belgian, and 1,837 French. The population is mostly Catholic. By the provisions of the London treaty of 1867 the duchy was declared neutral territory. On the death of William III., King of the Netherlands and Grand Duke of Luxemburg, in November, 1890, Adolf, Duke of Nassau, succeeded to the duchy. It is governed by the grand duke and a chamber of deputies, elected directly by the cantons. For commercial purposes Luxemburg is included in the German customs union. The estimated revenue for 1901 was 12,098,920 francs (franc equals 19.3 cents) and the expenditure 12,472,060 francs. The debt is 12,000,000 francs, funded at 3½ per cent., chiefly incurred by railway construction. The savings banks, January 1, 1900, held 15,896,928 francs. The mining and smelting industries are of considerable importance, comprising, in

1899, 72 iron mines, 8 smelting works, 28 blast furnaces, and 7 refining foundries, employing 11,095 workmen. There are 294 miles of railway, 596 miles of telegraph line, and 582 miles of telephone lines. The post-offices number 84.

McADAM, DAVID, justice of the New York Supreme Court, died in New York City, December 22, 1901. He was born there, August 25, 1835, and was educated in the public schools. Admitted to the bar in 1859, he remained in active practice until 1874, when he was first elected a judge of the marine court, afterwards the city court. From 1882 to 1890 he was chief justice of the city court, and in 1891 was elected to the superior court, from which position he went to the supreme court as associate justice in 1896. He was known as a most indefatigable worker and a judge of great discernment and balance. Justice McAdam wrote: *Marine Court Practice* (1868); *Landlord and Tenant* (1875); *Terms of Court* (1875); and a short time before his death he had completed a work on *The Law of Negligence as Applied to the Relations of Landlord and Tenant*.

MCCARTHY, RICHARD DOYLE. See CARTE, D'OYLY.

MACEDONIAN COMMITTEE. See BULGARIA.

McCLURG, General ALEXANDER CALDWELL, American publisher, died at St. Augustine, Fla., April 15, 1901. He was born in Philadelphia in 1835, and graduated at Miami University, Oxford, O., in 1853. After studying law for a time, he entered the publishing house of S. C. Griggs and Company, in Chicago. He enlisted in the Union army in 1862 and rose to the rank of colonel and brevet brigadier-general of volunteers. As chief of staff of the Fourteenth Army Corps, he fought in numerous battles, and was with Sherman on his march to the sea. Upon the close of the war, he became a partner in the Griggs house, which later became Jansen, McClurg and Company, and finally A. C. McClurg and Company. In 1899, after the establishment was destroyed by fire, General McClurg reorganized the business on the lines of industrial cooperation, much of the stock being distributed gratis among the employees of the company and more sold to them on easy terms.

MacCORMAC, Sir WILLIAM, British surgeon, died at Bath, England, December 4, 1901. He was born at Belfast, Ireland, January 17, 1836, and was educated in medicine in Dublin and Paris, and at the Queen's University of Ireland, Belfast. After practicing for a time in Belfast and London, in 1870, at the outbreak of the Franco-Prussian War, he joined Dr. Franks, a former English army surgeon, and Dr. Sims, an American, in establishing the Anglo-American ambulance system, and was present at the battle of Sedan, where his services attracted the favorable notice of the officers. Upon his return to England he was made assistant surgeon to the newly-built St. Thomas' Hospital, and later was made chief surgeon. In 1896 he was chosen president of the Royal College of Surgeons of England, a position to which he was thrice reelected. He published: *Notes and Recollections of an Ambulance Surgeon* (1870); *Antiseptic Surgery* (1880); and *Surgical Operations* (1885).

McKINLEY, WILLIAM, twenty-fourth President of the United States, died at Buffalo, N. Y., on September 14, 1901, from a bullet wound received at the hand of an assassin on September 6, while holding a public reception at the Pan-American Exposition. He was born in the village of Niles, Trumbull County, O., January 29, 1843, and came of Scotch-Irish stock, of which the first American representative settled in Pennsylvania about the middle of the eighteenth century. William McKinley, after attending for a time the school of his native village, was taken by his parents to Poland in Mahoning County, to enjoy the better educational advantages offered by the academy in that town, where, as a student, he soon distinguished himself by his assiduity, and particularly by his parliamentary skill in the academic literary society. At sixteen he entered the junior class of Allegheny College, at Meadville, Pa., but was compelled by poor health to abandon his collegiate career shortly afterward, and became a teacher in the public schools. Responding to President Lincoln's call for volunteers after the firing on Fort Sumter, he enlisted as a private in the Twenty-third Ohio Volunteer Infantry, on June 11, 1861, in which regiment Rutherford B. Hayes was a major. McKinley's first promotion was to commissary-sergeant on April 15, 1862, and in this line of duty he performed meritorious service at the battle of Antietam, for which he was commissioned second lieutenant on September 24 of the same year. He served throughout the war, rising to the rank of major by successive promotions for merit, and at different periods served as aide to Generals Hayes, Crook, Hancock, and Carroll. At the close of the conflict, although personally desirous of following a military career, he left the army in deference to the wishes of his family and entered the law office Judge Glidden at Canton, O. In 1867 he graduated at the Albany (N. Y.) Law School, and being admitted to the bar of Ohio, began practice at Canton. From 1869 to 1871 he was prosecuting attorney for his county, but failing a reelection in the latter year, returned to his legal practice, although retaining an active interest in

•

•

•

WILLIAM MCKINLEY.

politics. In 1875, during the contest for governor, between Hayes and Allen, McKinley came for the first time into more than local prominence as a campaign orator, speaking for Hayes, the Republican candidate. In the following year he was sent to Congress and immediately became prominent for his advocacy of the principles of protection for American industries. From the time of his first election he served seven successive terms in Congress in spite of the fact that Democratic gerrymanders in 1878 and 1884 placed him in especially difficult districts. In his Congressional career, Mr. McKinley was from the very first a specialist in tariff legislation, and of him in this connection, Mr. Blaine said: "He was soon recognized in the House as one of the most thorough statisticians and one of the ablest defenders of the doctrine of protection"—the doctrine with which his name has always been most intimately associated. In 1880, in succession to James A. Garfield, he was appointed to the ways and means committee, and he remained an active member of that body during the rest of his Congressional service, becoming its chairman in 1890, and as such, the author of the "McKinley Bill," a high protective measure passed in that year. Coming as the bill did just before the election of representatives to Congress, its unfavorable reception by the country was clearly shown by the Democratic majority immediately chosen, and the measure received its death-blow before it had been fairly tested. Succumbing to the general Democratic victory and to the fact that his district had been gerrymandered professedly to keep him out of Congress, McKinley was defeated in 1890, although he reduced the prior Democratic plurality of 2,900 in that district to 302.

At once an agitation was started to secure his nomination for governor, and at the State convention in June of 1891, he was made his party's candidate by acclamation. During the ensuing campaign he delivered 134 speeches in every part of Ohio, dealing principally with detailed discussions of the question of protection and free trade. He was elected over Governor James E. Campbell by a plurality of 21,500, and two years later, having again received the unanimous nomination of the party, was elected by 80,995 plurality. During his first term (1893), Governor McKinley became involved in serious financial difficulties, by having too freely indorsed the notes of a personal friend. It was the governor's intention to retire from office in order to meet these obligations, but a subscription list circulated among his personal friends, of whom Mr. Marcus A. Hanna was a leader, raised the required amount (about \$100,000), and Mr. McKinley continued in office. In his second term he unfortunately gained an unpleasant notoriety from sensational newspaper stories charging him with "subservience to street-railway lobbyists." To increase the State revenue a bill was introduced to extend the "Nichols Law" (providing for the taxation of telephone, telegraph, and express companies, in the proportion of their property within the State to their property elsewhere), to cover freight and equipment companies and street railways. Later, the part relating to street railways was struck out, and from the fact that the men most actively interested in street railways in Ohio had also been the most prominent in defraying the governor's personal liabilities in 1893, a connection between the two circumstances was immediately discovered by his political detractors, some of whom did not hesitate to assert that McKinley had himself called on the author of the bill (Senator Whittlesey) to urge its alteration. Again, during the legislation to bestow on the legislature the power to grant street-railway franchises for 99 years instead of 25 as theretofore, when it transpired that a conference of senators and capitalists had been held in the governor's office, an additional clamor was raised by the Democratic press. Statements unusually harsh, more harsh than even the heat of political warfare ordinarily sanctions, were made against the moral as well as the civic character of the governor, and the persistent circulation of these canards overshadowed the substantial service rendered by McKinley during his incumbency. In his two terms he brought the National Guard to the highest point of efficiency it had ever known, he made judicious selections in his official appointments, restrained his legislatures from indulging in the extravagant appropriations and special legislation to which they were inclined, maintained the State charitable institutions on their high plane of excellence, and in particular, accomplished the organization of the State Board of Arbitration, the outcome of a plan previously explained by him in Congress. Need for such a body existed in Ohio, on account of the unsettled labor conditions, and the board was instrumental in averting subsequent rioting and bloodshed.

After his retirement from the governor's office McKinley lived in seclusion at Canton for a time. But he had already made his place in the national politics of the Republican party, and in 1896 he was called upon to accept the nomination for President, which on two former occasions he had avoided only by his strict adherence to lofty ideals of political justice. In 1888, as chairman of the Ohio delegation, which had been pledged to secure the selection of John Sherman as the Presidential candidate, he attended the convention of his party and became prominent as chairman of

the committee on resolutions. As the balloting progressed an effort was made to nominate McKinley, a movement which he quelled by declining in these words: "I cannot with honorable fidelity to John Sherman, who has trusted me in his cause and with his cause; I cannot consistently with my own views of integrity consent, or seem to consent, to permit my name to be used as a candidate before the convention. I do not request, I demand, that no delegate who would not cast reflection upon me shall cast a ballot for me." Again in 1892, while chairman of the convention of that year, he quieted a stampede in his favor by peremptorily demanding the withdrawal of his name from consideration, because he had pledged himself to accomplish the renomination of Benjamin Harrison. In 1896 he was nominated by the St. Louis convention on the first ballot, receiving 661½ out of 922 votes. The platform of the convention had declared unequivocally for the gold standard, and the uncertain position of Major McKinley on this question caused great anxiety throughout the party as to what his stand would be. This doubt arose from the remembrance that in his earlier political career he had advocated a monetary policy exactly opposed to what was embodied in the St. Louis platform, and no positive recantation of that policy had been publicly made. In 1878 he had favored the plan to resume the coinage of the silver dollar which had been discontinued since 1873 by coining "not less than \$2,000,000 nor more than \$4,000,000 of silver bullion per month" (Bland-Allison Bill)—this over President Hayes's veto and against his party; and in 1890 he was an ardent supporter of the Sherman Law, providing for larger purchases of silver. During his first term as governor of Ohio (1892), he announced that free coinage would be bad for the country, and in the Congressional campaign of 1894 he spoke vaguely in favor of the gold standard. In 1896, however, his speech in acceptance of the Presidential nomination heartily indorsed the gold plank in the party platform, and showed his monetary conversion to be complete. His principal opponent in the following campaign was William Jennings Bryan, of Nebraska, and the "paramount issue" the money question. Deeming it undignified for a Presidential candidate to tour the country in the effort to win a greater popular vote, McKinley remained at Canton, and there conducted what was perhaps the most remarkable campaign in American politics. From his own doorstep he delivered 300 speeches between June 19 and November 2, to persons who had come from all parts of the country to hear him, and in that time it was estimated that he addressed an aggregate audience of more than 750,000. The election gave McKinley a popular plurality of 601,854 votes out of 7,104,779, and in the electoral college the result was: McKinley, 271; Bryan, 176.

McKinley became President on March 4, 1897, with the following cabinet: Secretary of state, John Sherman; secretary of the treasury, Lyman J. Gage; secretary of war, Russell A. Alger; secretary of the navy, John D. Long; secretary of the interior, Cornelius N. Bliss; attorney-general, Joseph McKenna; postmaster-general, James A. Gary; and secretary of agriculture, James Wilson. In his inaugural address he recommended a new tariff law, a commission to study and propose changes in the fiscal laws, and the adoption of international arbitration treaties. A special session of Congress convened on March 15, and in response to a message from the President, passed the Dingley Tariff Bill. From the first the foreign relations of the country occupied the foremost position in Congress. The subject of the annexation of Hawaii was freshly agitated, and the President sent a new treaty to the Senate. Before any action was taken a protest was received from the Japanese minister, objecting to any arrangement that might conflict with the treaty already in force between Japan and Hawaii, which had been violated by the latter. This matter was settled by the agreement of Hawaii to pay a money indemnity to Japan, and the republic became formally a part of the United States on August 12, 1898. For many years the relations between Spain and the island of Cuba had been such as to cause the greatest concern in the United States. An insurrection of long standing existed there, which Spain was plainly demonstrating her inability to subdue. Charges of excessive cruelty were affirmed against Governor-General Weyler, and the starving condition of the Cuban reconcentrados aroused a bitter sentiment against Spain. The President at the beginning of his administration showed that his treatment of the matter was to be conciliatory. Urging upon Spain the desire of this country to see the conflict quickly ended, he offered to assist in the accomplishment of such a result by arbitration. The offer was declined, with the promise of administrative reforms that would soon end the insurrection. At the same time (October 23, 1897), Spain besought the United States to continue the measures to prevent filibustering expeditions which were giving great assistance to the Cubans. An autonomous government for Cuba was inaugurated in January, 1898, but because of its restrictive character changed affairs little or not at all. In the meantime public sentiment in the United States had become more hostile, and the jingo press was already clamoring for war. The anti-American element among the Spaniards in Cuba was growing daily more bitter, and in January Consul-General Fitzhugh Lee,

at Havana, requested that an American man-of-war be sent to that port for the moral effect it might have. The *Maine* was sent, which on February 15, was sunk by an explosion in Havana Harbor, with the loss of 2 officers and 258 men killed or drowned and 58 wounded. The press in general became more insistent for an immediate declaration of war, but the President was averse to an extreme move without exhausting every honorable means to reach a settlement short of war. Congress voted him \$50,000,000 to be used for the national defense at his discretion, and provided for the contingent increase of the army to 100,000 men. On March 1, the President communicated with Spain, stating that although the autonomist government had been in operation for two months and less harsh rules had been adopted for the prosecution of hostilities, affairs in Cuba were no better, and asked for further change in the position toward the island. On March 31, Spain submitted the following propositions: (1) To arbitrate the *Maine* catastrophe; (2) to do away with the reconcentration camps in the western provinces of Cuba and to place 3,000,000 pesetas to the credit of the poor farmers; and (3) to grant an armistice whenever asked for by the insurgents. With this reply, General Stewart L. Woodford, United States minister at Madrid, asserted his belief that in making these propositions the Spanish ministry had gone as far as it dared without incurring the danger of overthrowing the government by revolution. He also said: "There is no real war spirit here among the middle and lower classes. . . . [It] prevails only among the aristocracy and the generals and officers of the army." On April 3, he wired: "I know that the queen and her present ministry sincerely desire peace, and if you can still give me time and reasonable liberty of action, I will get for you the peace you desire so much and for which you have labored so hard." On April 5 he asked if the President would restrain Congress from hostile action, provided the queen would grant an immediate and unconditional cessation of hostilities for six months. "This," he said, "means peace." Secretary Sherman answered that the President would not longer delay his special message to Congress, but would refer to that body any message from the queen. On April 10, word was received that the unconditional armistice had been granted. On April 11, the President sent a special message to Congress, reviewing in detail the negotiations between the two countries, and leaving the decision to that body. A joint resolution was passed on April 19, recommending intervention to secure the independence of Cuba, and it was approved on the following day. On April 21, General Woodford received his passports, and four days later a resolution of Congress was approved, declaring that war had existed since the 21st. The President called for 125,000 volunteers, and by the end of the month they had begun to concentrate at Tampa, Fla. A blockade of Cuba was established on April 22, and on May 1, Admiral Dewey won a decisive victory over the Spanish fleet in the harbor of Manila, P. I. On May 19, a flying squadron under command of Commodore W. S. Schley left Key West, Fla., in search of the Spanish fleet that had left the Cape Verde Islands on April 29 under Admiral Cervera. It was located at Santiago, and Commodore Schley repaired thither, being joined there by Admiral W. T. Sampson, who took command of the American fleet on June 1. General William R. Shafter with 16,000 men embarked for Cuba on June 14 under the protection of 11 war vessels, and landed on the 22d at Daiquiri, 17 miles east of Santiago. After an engagement at Las Guasimas on June 24, the army took the heights of El Caney and San Juan on July 1-2. On July 3 Admiral Cervera sailed out of Santiago Bay, and, being met by the blockading fleet, all of his vessels were sunk or disabled in the ensuing engagement. The American troops took possession of Santiago on July 17. General Nelson A. Miles, the commanding general of the army, landed at Guanica, near Ponce, Porto Rico, on July 25, and in three weeks had taken complete possession of the island with the exception of San Juan. The peace protocol was signed on August 12 and the terms of peace were agreed upon December 10. The treaty, which was ratified by the Senate February 6, 1899, provided for the abandonment by Spain of all claims of sovereignty over and title to Cuba, the cession of Porto Rico and Guam, the cession of the Philippine Islands, and the payment by the United States of \$20,000,000.

Early in 1899 an insurrection against the authority of the United States broke out under Emilio Aguinaldo (*q.v.*) in the Philippines. The President had previously appointed a commission of five, Admiral Dewey, General Elwell S. Otis, Jacob G. Schurman, Dean C. Worcester, and Charles Denby, to investigate conditions in the Islands, and to offer recommendations for their administration, and he now placed General Otis in charge of the military operations there, to put down the insurrection with vigor. A serious problem arose in the fact that the volunteers then in the Philippines had enlisted only for the Spanish War, and for that reason it was necessary for them to be repatriated. Additional regiments were organized, especially for Philippine service, and the uprising was put down by districts as fast as the elusive tactics of the Filipinos and the conformation of the islands would permit. The capture of the rebel leader by General Frederick Funston (*q.v.*), in March, 1901,

sounded the end of organized revolt, the fighting thereafter being carried on by scattered guerrilla bands, with inefficient leaders and defective organization. The first Philippine Commission completed its report and was discharged on January 31, 1900, and a new one was appointed, headed by Judge William H. Taft, which after painstaking and thorough investigation of the political needs of the Filipinos, established a civil government with headquarters at Manila, on September 1 of the same year. In 1900 occurred the Boxer uprising in the Chinese empire, by which the United States, in common with other Powers, sustained losses of life and property. In the subsequent indemnification proceedings, the same spirit of conciliation that characterized former official acts of President McKinley was seen, and in these negotiations he was notably assisted by his able secretary of state, John Hay (*q.v.*). Other important events which occurred during the McKinley administration were the settlement of the Samoan question, by which the tripartite government of Great Britain, Germany, and the United States was abandoned, November 8, 1899, Great Britain and Germany relinquishing all claims to the islands east of 171°, which include Tutuila, with its splendid harbor of Pago-Pago; the establishment of colonial government in Porto Rico; the reorganization of the army; the consummation of the Hay-Pauncefote Treaty, providing for the construction of the Nicaragua Canal under American control; the improvement of the merchant marine; and the establishment of reciprocity treaties with European governments. In 1900 President McKinley was unanimously renominated, and was reelected, with Theodore Roosevelt (*q.v.*), of New York as Vice-President, by an electoral vote of 292 to 155 for Bryan and Stevenson. He attended the Pan-American Exposition at Buffalo in September, 1901, accompanied by Mrs. McKinley and some of his cabinet, and was received there with distinguished honors. After being shot he was taken to the private residence of John G. Milburn, the president of the exposition, and noted surgeons attended him, but were unable to save his life. Thursday, September 19, the day of the interment at Canton, was observed as a time of national mourning. In the cities throughout the United States as well as in foreign capitals, memorial services of the most impressive character were held, and the President's death was mourned as that of one who had entered deeply into the universal heart.

It was the lot of William McKinley to conduct an administration at a period replete with events of tremendous moment to his country; but how far he controlled those events and how far he was mastered by them, it is perhaps for another generation to decide. He saw a war, the outcome of which placed the United States in the first rank of world powers, and assuming the responsibilities of such a position, he caused the application to the constitution of an entirely new interpretation of the right to acquire territory. In his administration occurred the first acquisition of territory as colonial possessions, to be ruled by representatives appointed by the central government, and in 1901 the supreme court rendered a decision confirming the right of the United States to govern such territories as dependencies without providing for their incorporation as States and without according their inhabitants the rights of citizenship. (See UNITED STATES, paragraph Constitutional Status of Porto Rico and the Philippines.) His experience in Congress taught him how to treat that body, and throughout his administration the most harmonious relations existed between Congress and the President. This frictionless state of affairs presented a striking illustration during 1898, when Congress did not demand, as it might with perfect propriety have done, the publication of the negotiations between the President and General Woodford, which as a matter of fact were not given to the public until two years after the close of the Spanish War. When defective bills were introduced, the President was in the habit of summoning the authors, and by explaining the inconsistencies to them, contrived to have the measures offered in acceptable form, which explains his small use of the veto power. Personally, his views on the two leading questions of his twenty-five years of public life, the monetary standard and the tariff, present a remarkable metamorphosis. His position on the money question has already been described; but his change on the theory of tariff, while not so complete, is fully as important. In 1888, he said: "A revenue tariff is inconsistent with protection, it is intended for a wholly different purpose. . . . It can have but one effect—that of opening up our markets to the foreign producer, impoverishing the home producer and enriching his foreign rival." On September 5, 1901, the day before his assassination, he said: "We must not repose in fancied security that we can forever sell everything and buy little or nothing. . . . Reciprocity is the natural outgrowth of our wonderful industrial development under the domestic policy now firmly established. . . . If perchance some of our tariffs are no longer needed for revenue or to encourage or protect our industries at home, why should they not be employed to extend and promote our markets abroad?" It has been often declared, by friends and enemies alike, that McKinley always "had his ear close to the ground," a statement that finds no better illustration than the contrast furnished by the foregoing quotations. Before everything else a party man, he

showed in his development the submission to changing conditions in his party and the desire to accomplish acceptable legislation. In his private life McKinley presented a model character, one phase of his personality, at least, to which his detractors can offer no slight. In 1871 he married Miss Ida Saxton, of Canton, and from this union two daughters were born, both of whom died in childhood. A confirmed invalid, Mrs. McKinley depended upon the constant care of her husband, whose burdens were never too heavy nor his moments too full of anxiety to deprive her of the devoted attentions it was his delight to pay.

McMAHON, Mgr. JAMES, Roman Catholic divine, died at Washington, D. C., April 15, 1901. He was born in Ireland in 1817, and was educated at the College of Maynooth and at the Seminary of St. Sulpice in Paris. In 1843 he was placed in charge of the parish of St. Mary's in New York City, and in 1867 was transferred to St. Andrew's in that city, where he remained for twenty years. Father McMahon gave to the Catholic University in Washington a hall of philosophy, which was completed in 1895 at a cost of \$400,000. For this munificence Pope Leo XIII. conferred upon him the honorary title of Monsignor.

MACRAE, DOUGLAS GORDON, English editor, died in Switzerland, April 3, 1901. He was born in Aberdeenshire, April 6, 1861, and was educated at the Shoreham Grammar School. Upon leaving school he became a printer's apprentice, and at the same time contributed to various papers, including the *Cricket*, *Eastern Province Herald*, and Cape papers. Mr. Macrae was most widely known as editor of the *Financial Times*, of London, which he established (1884) after some years of successful printing. He was a close student of finance, customs, commerce, and industries, traveling extensively to carry on research work, and, in particular, was an authority on mining.

MADAGASCAR, an island in the Indian Ocean, lying east of Portuguese East Africa, constitutes a French colony.

Area and Population.—If Australia is regarded as a continent, Madagascar is the third largest island in the world, having an estimated area, including adjacent islands, of 228,500 square miles. No census of the island has ever been taken, and estimates of the population vary from 2,500,000 to 7,000,000. The estimate of the governor-general (1900), 3,500,000, is probably more nearly correct. The largest and most important element in the population are Hovas, a tribe allied to the Malays racially and numbering, it is estimated, over 1,000,000. There are three or four other native tribes of considerable importance, and the coast towns have an admixture of Chinese, Hindus, Malays, and Mauritian creoles. The capital and largest city is Antananarivo, situated 80 miles inland from the eastern coast, and having a population of about 100,000. The principal ports are Tamatave, on the eastern, and Majunga, on the northwestern coast. In 1895 the Christian population was estimated at 450,000 Protestants, principally connected with churches established by the London Missionary Society, and 50,000 Roman Catholics. Since the more complete establishment of French rule, however, efforts have been made by the authorities to break down the Protestant influence, and although decrees have guaranteed religious freedom, the pressure brought to bear by the Catholics allied with the government has been such that many Protestants have embraced Catholicism, at least nominally, as a matter of policy, and considerable Protestant church property has come into the possession of the Catholics. The interior tribes are still mostly heathen. The colonial government has organized a school system including, besides primary schools, rural industrial and agricultural schools, and superior schools, having departments for instruction in medicine and law, and for the training of teachers.

Government and Finance.—Although the French claim to Madagascar dates back to 1642, the colony was not established until 1896, when General Joseph S. Gallieni was appointed governor-general, a position he has held ever since. There is an administrative council at Antananarivo and the coast towns are in charge of residents and vice-residents; but the greater part of the colony is still under military rule, an army of about 8,000 French and the same number of natives being maintained. The queen was formally deposed in 1897, and exiled to Réunion and then to Algiers.

The principal sources of revenue are direct and indirect taxation, but, not considering the expenses of the military operations and occupation, the ordinary revenue is never quite sufficient to meet the expenditure, and a considerable annual subvention from France is necessary. The local revenue is rapidly increasing, however, having advanced from 9,336,000 francs in 1899 to 19,500,000 in 1900, and was estimated at 25,000,000 francs for 1901. The military expenditure of France in Madagascar amounted in 1900 to 22,375,482 francs, and the budget estimate for 1901 amounted to 29,147,000 francs. The total expenditure for military purposes since 1895 has been over 176,680,000 francs. The total cost of Madagascar to France for 1901 was estimated at 31,602,449 francs. The franc is worth 19.3 cents.

Production, Commerce, etc.—The chief products of the island are rice, tobacco, hemp, cotton, vanilla, tea, coffee, rubber, and sugar-cane. The foreign trade of the colony has increased rapidly in the past few years. The imports in 1896 amounted to 13,897,931 francs; in 1899, 27,994,000 francs, and in 1900, 39,270,000 francs. The exports in the same years were 3,605,952 francs, 8,046,000 francs, and 13,203,300 francs respectively. The trade, which was formerly about equally divided between the French and English, was in 1900 almost entirely in the hands of the French. In 1901 a government railway was being constructed to connect Antananarivo with the port of Tamatave. The road is to be wide-gauge, 180 miles in length; the construction is difficult, it being necessary to drill 12 tunnels, the longest 828 feet long, and to build a bridge 327 feet long across the Mangoro River.

General Gallieni, as a result of pressure being brought to bear in France, practically abolished the *corvée*, or system of enforced state labor, on January 1, 1901. In place of it an increase was made in the native poll tax, a burden which the native population was not able to bear, and which brought on serious economic problems. With the idea of ameliorating their condition, the governor-general provided employment in government and private workshops at a franc a day. A military expedition sent out in October, 1901, to subdue a number of tribes in southern Madagascar that had refused to acknowledge French authority met with complete success in the following month. In the early summer of 1901 ex-Queen Rānavālonā III. was permitted temporarily to leave Algiers and visit France, including Paris.

MADEIRA, a group of islands in the north Atlantic, 338 miles from the African coast, constitutes an administrative district of Portugal. The area is 505 square miles and the population about 134,000. The inhabitants are a mixture of Portuguese, Moors, and negroes. The capital is Funchal (population about 20,000). Grape culture is extensive, though the industry has been checked by diseases of the vines. The coffee tree has partly replaced the vineyard. Rice, sugar, coffee, bananas, oranges, and pineapples, and some wheat are cultivated. The climate is equable and temperate to a degree that has led to the visits annually of large numbers of invalids. About the 1st of March, 1901, a cable was completed from Falmouth, England, to the Cape Verde Islands, passing through Funchal, and two cables were completed connecting Funchal with Lisbon, one of which is continued to Brazil.

MAETERLINCK, MAURICE, Belgian mystic and author, whose latest book, *The Life of the Bee*, was published in 1901, was born in 1864. He is regarded as representative of the so-called young Belgian school of poets, whose device, *pro arte*, has become familiar. In 1886 Maeterlinck passed some months in Paris, where he came much under the influence of Villiers de l'Isle-Adam, the French mystic. In the most characteristic of his work there is undeniable power, combined with a strangeness of manner which is best illustrated in his dramas. These include: *Les Aveugles*, *L'Intruse* (1898), *La Princesse Maleine* (1891), *Les Sept Princesses* (1891), *Pelléas et Mélisande* (1892), and *La Quenouille et la Besace* (1893). Among his poems are the volumes: *Serres Chaudes* and *Les Douze Chansons* (1896). *The Life of the Bee*, translated in 1901, is by no means technical in treatment; it is full of lyrical passages, of reflections, analogies, and poetical digressions.

MAGEE, CHRISTOPHER LYMAN, American politician, died at Harrisburg, Pa. March 8, 1901. He was born at Pittsburg, April 14, 1848, and received an academic education. He early became active in local politics, and was cashier of the city treasury at twenty-one. He was city treasurer, 1871-77, and a member of the Pennsylvania senate from 1896 until his death. An energetic Republican, Senator Magee was a delegate to every national convention of his party after 1876, and in the last few years of his life gained great prominence as a political enemy of Senator Quay. He was actively interested in many business enterprises, being, among other interests, proprietor of the *Pittsburg Times*, which he purchased in 1884 and changed from a moribund sheet to an influential party organ, and of the *Daily News*, which he founded in 1896.

MAGNESITE. The production of magnesite in the United States in 1900 was 2,252 short tons, valued at \$19,333, as compared with 1,280 short tons, valued at \$18,480, in 1899. California supplied the entire output.

MAINE, a New England State, has an area of 33,040 square miles. The capital is Augusta. Maine was admitted to the Union March 15, 1820. The population in 1900 was 694,466, while in June, 1901, as estimated by the government actuary, it was 698,000. The largest city is Portland, whose population in 1900 was 50,145.

Finances.—The receipts of the treasury for the year ending December 31, 1901, were \$2,392,022.86, the expenditures were \$2,293,064.70, leaving a balance in the treasury of \$297,837.17. A temporary loan of \$350,000 outstanding January 1, 1901, which matured during the year, was canceled. New notes to the amount of \$250,000 were issued during the year. On December 31, 1901, the State debt was \$2,303,000,

of which \$2,053,000 was bonded; \$150,000 was paid on the debt during 1901. The State tax rate for 1901 was 2¾ mills per dollar, and the total value of State property as returned for taxation was \$336,699,649.

Industries.—From the *Census Reports* of 1900 it appears that there has been a marked growth in the mechanical industries of Maine during the half century ending 1900. In that time the population has increased from 583,169 to 694,466, or 19.1 per cent., while the average number of industrial wage-earners has increased from 28,020 to 74,816, or 167 per cent., embracing in 1900 10.8 per cent. of the entire population. In the latter year there was engaged in the 6,702 manufacturing establishments reporting a capital of \$122,918,826, exclusive of capital stock, and the gross annual value of the products was \$127,361,485, while the net value of the products, exclusive of products re-used in the process of manufacture, was \$84,210,956. Generally speaking, the success of industries in Maine has depended upon two prime factors: First, the great extent of her forests, and second, the extensive water power furnished by her rivers and the facilities for commerce given by her numerous ports. To the latter factor alone Maine is indebted for her largest industry, that of the manufacture of cotton goods. The plants of this industry, "located without exception at the falls of large rivers," turned out products in 1900 valued at \$14,631,086; nevertheless, cotton manufacturing in Maine and indeed throughout the New England States shows signs of decline, owing to the establishment of rival plants in the South, close to the supply of raw material. The third most important industry of the State, that of wool manufacture, is at present more promising, turning out products in 1900 valued at \$13,412,784, an increase during the decade of 53.5 per cent. A smaller but more interesting industry is the canning and preserving of fish, whose products in 1900 were valued at \$4,779,733, an increase since 1890 of 187.8 per cent. This increase has been due, to a considerable extent, to the canning of small herring, called commercially "sardines," and brought into competition with the genuine imported sardines, to which in fact the Maine "sardines" are said to be much superior. Among other industries may be mentioned that of flour and grist milling, with products in 1900 valued at \$3,399,832; foundry and machine-shop products, valued at \$3,298,706; and leather manufactures, with products valued at \$2,451,713.

Forests and Forest Products.—Owing to her forests and many rivers, industries dependent upon an abundant and accessible supply of wood have always returned very large values in Maine. Formerly pine was the staple "raw product" used; but with the exhaustion of this, spruce and hardwoods are now extensively employed. In 1900 lumber products returned a value of \$13,489,401, an increase since 1890 of 13.8 per cent. At the same time the increase in paper and wood-pulp manufactures during the decade was from \$3,281,051 to \$13,223,275, or 303 per cent. This great increase has been due to the discovery and increased use of wood pulp as a material for paper manufacture, and the rise of the new industry has been particularly fortunate for Maine, owing to the decline of her ship-building industry. For in 1900 the products of this latter industry were valued at only \$2,491,761, though in early days Maine was the leading ship-building State of the Union, launching more than half of all the sea-going vessels of the nation. Even the remnant of shipping industry in Maine has now changed in kind, steel vessels being undertaken at the Bath Iron Works, and in wood a few four and five masted schooners being built instead of the swarm of two and three masters, as formerly.

Legislation.—The legislature convened on January 2, 1901, and was prorogued on March 22. Few important bills were passed, and of those nearly all related to taxation or to regulative measures for insuring the financial stability of corporations doing business in the State. Of these latter, the most important was a law providing that every trust and banking company should set aside yearly, as a guaranty fund, not less than 10 per cent. of its net earnings until this fund and the interest accruing thereon amounted to one-fourth of the capital stock. This surplus should then be kept intact. Banking and trust companies were furthermore prohibited from making a loan to any of their directors, officers, agents, or employees until such loans should have been approved by the board of directors and the fact of the loan placed upon the records of the corporation. Such corporations, also, were enjoined from making loans or discounts on the shares of their capital stock, or from purchasing or holding such shares, unless this should be necessary to prevent loss of a debt previously contracted in good faith, and all stock thus acquired should be disposed of within a reasonable time at private or public sale. It was further provided that no trust or banking company should establish a branch office in any city or town other than that in which the parent institution was situated, until such branch office was authorized by a special act of the legislature; this provision, however, was not to apply to branch offices already established and in operation under existing charter rights. Measures for increasing the annual revenue derived from corporations in the State provided that express companies should pay

the State treasurer 2 per cent. of their gross receipts from business done in the State, instead of, as previously, $1\frac{1}{2}$ per cent.; that foreign banking associations doing business in the State should pay an annual tax of $\frac{3}{4}$ per cent., instead of, as previously, $\frac{1}{4}$ per cent. of the gross amount of the value of the business that they did in the State; and that every corporation operating palace or sleeping cars for which extra compensation was charged should pay an annual excise fee equal to 4 per cent. of their gross earnings. Telegraph and telephone companies, previously taxed in accordance with the value of their property in the State, will under a new law be taxed in accordance with their gross receipts. The collateral inheritance tax was raised from $2\frac{1}{2}$ to 4 per cent. upon inheritances. Other acts were as follows: Punishment for kidnapping was raised from a maximum of 5 years' to a maximum of 20 years' imprisonment. The use of voting machines was authorized, provided they had been first examined and declared to be satisfactory and efficient by the proper officers; the State board of agriculture was abolished, and instead a single commissioner of agriculture was directed to be appointed; cities and towns were authorized, upon the affirmative vote of the electors, to establish manual training high schools; provision was made for the revision of the State statutes. Several new provisions were made with regard to the game laws, of which perhaps the most interesting was that enacting that any hunter who mistook a man for an animal and shot the man should be punishable by a fine of not more than \$1,000 or by imprisonment for ten years, or by both; and if the county attorney or sheriff did not prosecute all such cases, he also should be liable to a fine of not over \$1,000. The intent of the law was stated to be the prevention of involuntary murder, but the apparent effect of the law will be to turn \$1,000 into the treasury for each and every man killed.

Elections.—The Republican caucus of the Maine legislature nominated Senator William P. Frye to succeed himself as senator, and he was elected by the legislature on January 13 for the full term ending March 4, 1907. The vote on the election stood: In the Senate, Frye, 24; S. M. Staples (Democrat), 1; not voting, 6; and in the House, Frye, 107; Staples, 13; not voting, 31. Mr. Frye has served continuously in the Senate since 1881. As author, and to a large extent promoter, of the ship-subsidy bill (see UNITED STATES, paragraph Ship Subsidy) pending before Congress, he has increased his prestige in Maine, owing to the large shipping industry, especially at Bath, whose prosperity is believed to be in a large degree dependent upon the passage of the subsidy bill. The death of Charles A. Boutelle (*q.v.*), congressman from Maine, necessitated a special election to fill the vacancy so caused. In his place Llewellyn Powers (Republican) was elected, receiving 8,359 votes as against 5,508 cast for Thomas White, his Democratic opponent.

State Officers.—Governor, John F. Hill, Republican, elected for two years, term ends January 1, 1903; secretary of State, Byron Boyd; treasurer, Oromandel Smith; attorney-general, George M. Seidus; superintendent of education, W. W. Stetson; insurance commissioner, S. W. Carr; land agent, Charles E. Oak.

Supreme Judicial Court: Chief justice (term seven years, which will expire in September, 1905), Andrew P. Wiswell, appointed by governor, January 2, 1900, to fill vacancy caused by resignation of John A. Peters; associate justices, Lucilius A. Emery, W. P. Whitehouse, Sewall A. Strout, Albert R. Savage, William H. Fogler, Frederick A. Powers, and Henry C. Peabody—all Republicans except Sewall A. Strout, Democrat.

Congressional Representatives (57th Congress).—In the House: Amos L. Allen, from Alfred; Charles E. Littlefield, from Rockland; Edwin C. Burleigh, from Augusta; and Llewellyn Powers, from Houlton—all Republicans. In the Senate: Eugene Hale (until 1905), from Ellsworth, and William P. Frye (until 1907), from Lewiston, president *pro tempore* of the Senate—both Republicans.

MALARIA. This term has been adopted for the disease formerly known as ague, fever and ague, intermittent fever, and remittent fever, and also covers the severe terminal type of the same disease improperly termed typho-malarial fever, as well as the type formerly called chronic malarial infection. It was formerly believed that the cause of the disease was miasma, or foul air, arising from marshy localities. In 1717 Lancisi, the physician of Pope Clement XI., in his work, *De noxiis paludum effluviis*, suggested that there might be in swamp air minute insect life causing intermittent fever. But it was reserved for Laveran, in 1880, to discover the malarial parasite, and to show that it is not a bacterium, but a protozoön, which lives and is developed in the red-blood corpuscles of human beings. The additional fact was absolutely established during 1899 and 1900, by Marchiafava, Celli, Grassi, Bignami, Bastianelli, Marshall, Sanbon, Low, Ross, Manson, and others, that malaria is caused by a micro-organism carried by the mosquito. The results of these investigators have been corroborated by many other scientists scarcely less noted. The *hamamaba* which causes malaria passes through a regular alternation of generations in its life history. For the perfection of its sexual

generation it must needs be in the body of a mosquito, while its asexual generation requires the erythrocytes (red-blood corpuscles) of man. From drinking water containing the protozoön of malaria man becomes infected with the organism, which, however, cannot fully develop in him. The mosquito which bites the infected man receives the parasites along with the victim's blood, and in the mosquito they develop perfectly. Then, in turn, the mosquito, thus infected with the micro-organisms which have passed through regular sexual generation, and carrying them in the saliva which anoints the lancets in his proboscis, transmits them to the next human being she bites, and this one has malaria as a consequence. C. W. Daniels reported in the *British Medical Journal*, in January, 1901, the results of many experiments in Africa, which led him to fix upon a certain mosquito (*Anopheles funestus*, Giles) as the chief agent in the distribution of malaria in East and Central Africa. Of 57 specimens of this mosquito which were fed on a patient whose blood contained *hamamaba* in crescent form, 27 were found to be infected. Infection of these mosquitoes resulted in 46 instances, or 35.5 per cent., of the 129 times these 57 mosquitoes had fed on the patient. He found a very high degree of malaria prevalent in the natives in early life, as evidenced by chronic enlargement of the spleen. Of 851 children under 15 years of age, 216 had enlarged spleens. It was announced in April, 1901, that Professor Robert Koch, of Berlin, the discoverer of the bacillus of typhoid fever and the bacillus of tuberculosis, intended to organize expeditions to Africa to investigate the origin of malaria. It appears that he has been forestalled by the work already done, and that his results will be simply corroborative. The sanitary department of Havana, it is said, announced in 1901 its intention of planting eucalyptus trees in marshy and malarial districts in and about that city. Professor Celli, however, is authority for the statement that the eucalyptus, like any other tree, is no protection against malaria, but adds to its dangers by furnishing a shelter for mosquitoes. See INSECTS AND THE PROPAGATION OF DISEASES AND ENTOMOLOGY.

MALAY STATES, FEDERATED. See FEDERATED MALAY STATES.

MALTA, a Mediterranean island 58 miles south of Sicily, constitutes, with Gozo, Comino, and several islets, a British crown colony. The island of Malta has an area of 95 square miles and a population of about 158,000, while the area of the entire colony is 117 square miles and the population at the beginning of 1901 was 183,679, exclusive of British troops to the number of 8,391. The capital is Valetta, a port of call and naval station, with about 50,000 inhabitants. The colony is administered by a governor, who is also commander of the troops (General Sir Francis Wallace Grenfell since 1899); he is assisted by an executive and a legislative council. Revenue, which accrues chiefly from customs, and expenditure amounted in 1899 to £354,265 and £351,354 respectively; in 1900 £356,758 and £365,943 respectively. The debt is about £79,000. The principal products are cotton, potatoes, fruits, honey, and corn; cotton goods, laces, and matches are manufactured. The actual imports and exports in 1899 amounted to £976,330 and £40,250 respectively; in 1900, £1,026,829 and £48,802 respectively. The goods in transit in 1899 were valued at £5,692,651 for imports and £5,409,251 for exports; in 1900, £6,407,460 imports and £6,422,765 exports. The most important article in the general trade is wheat. In 1899 there entered 3,560 vessels of 3,297,712 tons, and cleared 3,560 vessels of 2,301,795 tons. There are eight miles of railway.

The language question—English versus Italian—continued to cause friction in 1901. It will be remembered that, according to a decision of the imperial government, the use of English became allowable in the Maltese courts on March 22, 1899, and that after fifteen years court proceedings would be conducted entirely in that language. This decision was deemed justifiable, since a large majority of parents in Malta and Gozo had elected for instruction in English in the schools. Much dissatisfaction ensued, and the opponents of the English programme refused to vote taxes and public improvements, and on May 5, 1901, a mass-meeting of over 10,000 persons was held at Valetta to protest against the substitution of English for Italian and against a proposed increase of local taxation. The imperial government decided to legislate on certain matters by an order in council, and new taxes were laid by that method. In protest against this measure another mass-meeting of some 12,000 or 15,000 people was held on August 11, 1901. The meeting was followed by a number of demonstrations hostile to British authority. The question of language has assumed considerable importance in various parts of the world—Czech against German in Austria, Polish against Russian and German in the territory of the former kingdom of Poland, French against German in Alsace-Lorraine, Russian against Finnish and Swedish in Finland, English against Dutch in South Africa, English against Spanish in Cuba and the Philippines, and English against Italian in Malta.

MALTA FEVER. A fever which has been more thoroughly studied in Malta than in any other locality is termed Malta fever, Mediterranean fever, Neapolitan fever, rock fever, and by several other less familiar names. It is the rock fever of

Gibraltar, and besides occurring at Malta is found in Sardinia, Sicily, Crete, Constantinople, Smyrna, Tunis, Algiers, Naples, and other Italian coast cities in endemic form. The micro-organism that is its cause was discovered by Dr. David Bruce, of the British army, in 1887, and named *micrococcus melitensis*. It is found in the liver, spleen, and kidneys of the patient. The mode of its entrance into the body is unknown. It is a round or slightly oval coccus, appearing when unstained as a bright point in active molecular motion, occurring rarely in pairs, never in chains, and measuring 0.3 of a micromillimeter in diameter when dry. Most cases occur in July, June, May, and August, in the order named. The symptoms of Malta fever are discomfort, headache, pains in the bones, sleeplessness, congested face, occasionally nose-bleed, yellow-coated tongue, loss of appetite, nausea, constipation, enlargement of liver and spleen, cough, and profuse perspiration. Delirium is rare, but progressive weakness is marked, and swollen joints with great pain form the principal difficulties during the second week of the disease. The fever may pursue a rapid course, and the patient may die under the mistaken diagnosis of typhoid fever; or the attack may be prolonged for many weeks, the average being 90 days. The death-rate is about 2 per cent. One attack grants immunity to the sufferer, in the opinion of Bruce, contrary to the idea prevailing in the British service. In the treatment of the disease, Bruce believes quinine and salicylates are harmful. He advocates cold baths or cold sponging, antipyrin for relief of headache, bromides for nervous conditions, and counter-irritation for joint involvements. His diet list includes eggs, milk, broths, fresh lemon juice, and brandy at first, with gradual resumption of soft solids. Malta fever has become established in the United States, by importation from the Philippines and from Porto Rico. Currier reported in 1901 eight cases of the malady in the Army and Navy Hospital at Hot Springs, Ark., all occurring in soldiers returned from the Philippines. Though first considered cases of rheumatism, diagnosis was made by the testing of the blood with the *micrococcus melitensis*, which resulted in the characteristic serum reaction. These patients had been ill from 6 to 16 months. Strathe suspects the presence of Malta fever in Forsyth, Ga., in certain puzzling cases reported in 1901. In 1899 one case of the disease was reported in Philadelphia.

MAMMALOGY. Of all the interesting discoveries in zoology during 1901, there is none which appeals to the popular mind so much as the capture in Central Africa of the new large mammal, called the *Okapi*. For years, the existence of a zebra-like quadruped in the forests of Central Africa has been rumored, but no exact information was obtainable, since the white men who claimed to have seen it were ignorant of its real nature and indifferent to its scientific importance. But in 1900, Sir Harry Johnston (*q.v.*), special commissioner for the British protectorate of Uganda, became interested in the matter and determined to obtain, if possible, specimens of the strange animal for the British Museum. Accompanied by several whites and a number of blacks, he entered the Congo forest in search of the animal, but fever drove the party back. An official of the Congo Free State, however, Mr. Karl Erikson, finally purchased from a native soldier the body of a freshly killed specimen, and having the skin carefully removed, sent it with the skull, and the skull of a second smaller specimen to Sir Harry, by whom it was sent to London. Reaching the British Museum June 17, 1901, the specimens were promptly examined by Professor Lankester. He decided that though the animal is related to both the giraffe and the extinct *Helladotherium*, it represents a new genus, to which he gave the name *Okapia*, a Latinized form of the native name *Okapi*. The species he called *johnstoni*, in honor of the discoverer. Professor Lankester's report, with a colored plate of the animal, based on a colored sketch made by Sir Harry Johnston before the skin was shipped to England, was published in the *Proceedings* of the Zoological Society of London. The same plate, with an interesting popular account of the *Okapi*, by Sir Harry Johnston himself, appeared in *McClure's Magazine* for September. The *okapi* is about as large as a big stag. It has only two hoofed toes on each foot, with no trace of the so-called "dew-claws" or "false hoofs" of deer and cattle. The coloration is extraordinary, most of the body varying from sepia and black to rich vinous red, while the cheeks are yellowish white and the hindquarters and both pairs of legs are white or cream color, touched with orange and marked with more or less irregular, horizontal, purple-black stripes. On the forehead are three small knobs, the rudiments of horn-cores, like those of the giraffe. In its dentition and hoofs, the *okapi* is similar to the giraffe, and though the internal anatomy is unknown, there is little reason to doubt that the giraffe is the nearest living relative of this newly discovered mammal. So far as known at present, the *okapi* is found living only in the dense forests near the Semliki River, in the little territory of Mboga, and adjacent portions of the Congo Free State. Unlike the giraffe, it avoids open country, and escapes lions and other beasts of prey by slinking in the deepest recesses of the forest. It is hunted by the dwarfs and negroes, who greatly esteem the skin for ornamental belts, etc.

The okapi was not the only discovery Sir Harry Johnston made, for he also brought home a specimen of a five-horned giraffe, obtained near Mount Elgon. The study of this specimen in comparison with others from various parts of Africa, has shown that there are two well-marked species of giraffe in Africa, but they are not separable by the number or development of the horns, for rudiments of the extra three are present in all males. The more widely distributed and commoner form occurs throughout the greater part of Central Africa, and shades gradually into a South African sub-species. To this species, Sir Harry Johnston's five-horned specimen belongs. The giraffe of Somaliland, however, seems to be sharply separated and entitled to rank as a distinct species. The forests of Africa promise to produce some other remarkable animals, but it is not probable that any will exceed in interest and zoological importance the gorilla, which has long been known there. During the summer of 1901 an exceptionally fine specimen of this largest of apes was exhibited in Europe, and is now in the Tring Museum. Aside from its great size, the specimen is of interest because its exact history is known. It was shot in Yaunde, in the interior of the German colony of Cameroon, about fifteen days' journey from the coast, and four degrees north of the equator. It thus extends the known range of the gorilla considerably to the north. But Africa is not the only continent that furnished notable mammals during 1901. The Duke of Bedford brought to England twelve fine colts of the rare wild horse known as Przewalski's horse. This species was described twenty years ago from a single specimen captured in the deserts of Mongolia. Few specimens have been taken since, and all of these, with one exception, have been placed in Russian collections. It is therefore a source of much satisfaction to English zoologists that there is now opportunity for a careful study of the species.

The discussion of the question of the preservation of large mammals, has continued with no lack of interest, and with improving prospects of practical results. The British government has done much in Egypt and Central Africa to enforce the Wild Animal Preservation Ordinance of 1900, and a new ordinance was put in force during 1901, placing the exportation of wild animals under government control. The Canadian government has endeavored to enforce rigorous measures to protect the bisons still remaining in the Dominion. They are of the variety known as wood-buffalo, and are now found in three principal herds, ranging from Peace River to the Great Slave Lake, and numbering between 500 and 600. It is said that they are increasing in numbers now, and if the protective measures are continued may again become common. Unless proper precautions are taken, the United States will soon lose from its western coast the herds of sea-lions which are such an attractive feature of many Californian resorts. Owing to the claims of the fishermen that the sea-lions ate great numbers of salmon and other fish, the State Board of Fish Commissioners undertook the destruction of 10,000 sea-lions. During 1901, however, the Biological Survey of the Department of Agriculture produced evidence to show that the sea-lions rarely, if ever, eat fish, but live chiefly upon squid. In the light of such facts, serious efforts were made to prevent the killing of these interesting animals.

Literature.—It is difficult to select the most important works of 1901 dealing with mammals, but the following are fair samples. The structure of the hair in sloths and some other edentates is carefully discussed in the *Quarterly Journal of Microscopical Science*, by Dr. W. G. Ridewood, who points out the curious arrangement in the sloths, which permits the growth of algæ upon and in the hair, thus giving the covering of these animals its curious, moss-like appearance. The *Origin of Mammals* is discussed carefully by Professor J. S. Kingsley in *Science*; and similar papers on marsupials by Bensley, and on the toothed whales by Abel, have appeared, the former in the *American Naturalist* and the latter in the *Memoirs of the Royal Museum of Natural History of Belgium*. The most important book which has appeared in America is D. G. Elliot's *Synopsis of the Mammals of North America and the Adjacent Seas*. It is a volume of nearly 500 pages, illustrated with numerous plates and text figures, but entirely lacking artificial keys and having no allusions to habits and life histories. Even common English names are generally ignored. A very different but no less valuable work is Reighard's and Jennings's *Anatomy of the Cat*, a volume of over 500 pages, illustrated with 173 figures. The book is indispensable to students of mammalian anatomy, and will doubtless be of great use to both teachers and students in medical schools. In England, the second volume of Slater's *Mammals of South Africa* has appeared. It is a volume of 250 pages, devoted to rodents, bats, insectivora, cetacea, and edentates. Excellent accounts are given of many of the more interesting species, notably the elephant-shrews and golden moles.

MANCHURIA. See CHINESE EMPIRE (paragraphs Area and Population and The Manchurian Question).

MANGANESE. The production of manganese ores in the United States in 1900 was 11,771 long tons, valued at \$100,289, as compared with 9,935 long tons, valued at \$82,278, in 1899. The production in 1900 came from the six States of Virginia, Georgia, Arkansas, California, Montana, and Tennessee, in the order named, Virginia supplying 67 per cent. The native supply of manganese, besides coming from manganese ores proper, is also obtained from manganiferous iron, silver, and zinc ores. The greater quantity, however, of the ore consumed by American steel works is imported, the imports of 1900 having come chiefly from Russia, Brazil, Cuba, Chile, Turkey, Colombia, and Japan. The total imports amounted to 256,252 long tons, valued at \$2,042,361, as against 188,349 long tons, valued at \$1,584,528, in 1899.

MANITOBA, a province of the Dominion of Canada having an area of 73,956 square miles. The population, according to the census of 1901, was 246,464, as compared with 152,506 in 1891, an increase of nearly 62 per cent. Capital, Winnipeg, with a population of 42,336 in 1901, as against 16,697 in 1891. The public schools of this province are free and undenominational, and numbered in 1900 1,352, with an enrollment of 50,460. There are, besides, over 50 schools for Indian children, with an enrollment of nearly 2,000. Among the higher educational establishments of the province are 3 collegiate institutions connected with the public schools, and a normal school for the training of teachers.

Government and Finance.—At the head of the administration is a lieutenant-governor, assisted by an executive council of five members. The legislative power is vested in a single chamber, the legislative assembly, consisting of forty members, elected by popular vote. The province is represented by four members in the Dominion Senate and seven in the House of Commons. The ordinary revenue and expenditure for the calendar year 1900 amounted to \$905,331 (\$776,234 in 1899) and \$1,085,405 (\$972,462 in 1899) respectively. The main source of revenue was the Dominion subsidy, \$475,425, and the largest items of expenditure: Education, \$263,740; public works, \$236,130; and the treasury department, \$217,179. The gross debt amounted at the end of 1900 to \$8,615,863, as against \$8,190,688 at the end of the preceding year.

Industries.—The crops of Manitoba for 1900 were the smallest in the last decade. The yield of wheat fell from 27,922,230 bushels, or over 17 bushels an acre, in 1899, to 13,025,252 bushels, or less than 9 bushels an acre, in 1900. The oat crop also showed a decrease from 22,318,378 bushels, or nearly 39 bushels an acre, in 1899, to 8,814,312 bushels, or 20.5 bushels an acre, in 1900. The crops of potatoes, barley, flax, and roots all show decreases ranging from about 30 to 50 per cent. This was due to severe droughts. According to latest reports, the crops for 1901 were among the best in the history of the province. The acreage was increased to about 3,000,000 acres, of which over 2,000,000 acres were under wheat (1,457,396 in 1900), and the total yield was estimated at 50,000,000 bushels.

Commerce, Banks, etc.—The commerce of the province for the fiscal year 1900 shows an increase in both the imports and exports. The former amounted to \$6,691,864 (\$5,695,715 in 1899), mostly produce of the United States. The exports for the same year amounted to \$3,568,675, as against \$2,092,988 in 1899. There were in the province at the end of 1900 46 chartered banks and branches and 37 post-office savings banks, with 2,012 depositors and \$330,636 deposits. The government savings bank had 4,126 depositors and deposits amounting to \$949,991. The clearings during the year amounted to \$106,956,792. The railway lines had a total length of 1,815 miles at the end of the fiscal year 1900, as against 1,603 miles at the end of the preceding year. The total amount of subsidies paid out by the province up to the end of the fiscal year 1900 was \$2,595,777.

History, 1901.—The railway system was nationalized by the formal delivery of the Northern Pacific lines in Manitoba to the provincial government. A subsequent rearrangement in the leasing of the lines remedied the long-standing grievance of the high freight rates for produce from points in Manitoba to ports on the upper lakes. Eleven years of litigation and estrangement consequent on the abolition of separate Roman Catholic schools in Manitoba were ended by an agreement whereby all the Catholic schools of Winnipeg were taken over by the public school board and merged in the public system. The full Court of the King's Bench unanimously declared the prohibition law of July 3, 1900, *ultra vires* of the provincial legislature, and therefore unconstitutional and void. An appeal to the privy council of Great Britain would result, it was hoped, in the enactment of legislation strictly *intra vires* of the province.

MANUEL, EUGÈNE, French poet and educator, died in Paris in June, 1901. He was born in Paris, July 13, 1823, and was educated at the Lycée Charlemagne and the Ecole Normale. In 1868 he became professor of rhetoric at the Collège Rollin, and in 1871 entered the department of public instruction under M. Jules Simon. Becoming inspector-general of the department in 1878, he was made (1880) a member of the new Conseil Supérieur de l'Instruction Publique. M. Manuel was well

known through his poems, the first volume of which—*Pages Intimes*—was published in 1866. Other verses were gathered into a volume—*Pendant la Guerre*—in 1871. A dramatist of high rank, he wrote the play—*l'Absent*—which furnished Mme. Bernhardt with her first creation at the Comédie Française (1873). He wrote also a one-act social drama, *Les Ouvriers* (1870).

MANUFACTURES. Considerable activity characterized nearly every branch of manufacturing in the United States during the year 1901, and increase of business and the erection of new factories were features of many industries. The manufacturing interests showed in the general prosperity of the year, and trade as a whole was free from speculative excitement and disturbance, the first effect of which often falls on the manufacturer, who is unable to buy his raw material at a fair price or with reasonable certainty as to what it will be worth in the near future, while the buyer is apt to be more than cautious in purchasing the finished product. The year 1901 was marked by a general confidence and healthy tone in the manufacturing business, which, speaking generally, had few sensational features and exhibited natural growth and extension. These considerations apply to the manufacturing business at large; but of course the separate and leading industries demand special treatment, which is given under the heads mentioned at the end of this article. A few particular statements, however, dealing with American industrial conditions are here given.

In the manufacture of railway equipment the year 1901 made a record. The American Car and Foundry Company constructed about 81,000 freight cars and 610 passenger cars, the Pressed Steel Car Company about 35,000 freight cars, and the Pullman Company 10,945 freight cars and 626 passenger cars. The number of locomotives built in 1901 was also large. The Baldwin Locomotive Works constructed 1,391 locomotives of various forms, 174 of which were for export. The American Locomotive Company, which was formed by the consolidation of a number of smaller companies, built during the year 1,531 locomotives, of which 899 were built after June 15, when the company began business, and 632 by the constituent companies previous to consolidation. A reliable estimate of the year's manufactures of the chief features of railway equipment is as follows:

Passenger cars	2,500	Locomotives	4,300
Freight cars	196,000	Steel rails	2,700,000

In textiles there was activity during the year, which in part is discussed elsewhere (see COTTON, SILK MANUFACTURE, WOOL AND WOOLLEN MANUFACTURE). This activity, aside from productions, has manifested itself in a large number of new mills, which, however, is somewhat less than in the previous year. The mills, as regards locality, may be divided as follows: 1900—Northern, 150; Southern, 382—total, 532; 1901—Northern, 171; Southern, 298—total, 469. As regards classes of products, these mills may be grouped as below, it being understood that by knit goods is meant mills making hosiery and similar goods, while under miscellaneous are included silk, jute, bleaching, and finishing mills:

	1900.	1901.		1900.	1901
Cotton	338	219	Knit goods	96	110
Woollen	43	81	Miscellaneous	55	54

The great increase in woollen mills and the considerable number of new mills for the manufacture of knit goods indicate the prosperous and expanding condition of these industries, while decrease in the number of new cotton mills is explained by the large number constructed in 1900 and being equipped and put into operation in 1901.

EXPORTS OF MANUFACTURES.

	1901.	1900.	1899.
January.....	\$32,654,085	\$35,586,940	\$25,806,870
February.....	30,302,592	34,226,128	24,489,860
March.....	34,973,735	44,767,139	36,109,281
April.....	34,416,279	39,424,260	33,015,970
May.....	39,226,873	40,460,367	30,816,314
June.....	31,986,649	39,222,252	31,812,775
July.....	31,852,440	34,545,042	29,932,034
August.....	31,642,686	35,783,039	34,168,777
September.....	30,806,594	34,163,373	31,373,264
October.....	34,425,130	37,651,387	33,864,376
November.....	30,154,895	32,281,487	33,584,546
December.....	32,864,499	32,468,894	35,652,063
Total.....	\$395,144,080	\$441,406,942	\$380,787,891

As shown in the foregoing table, the value of the exports of manufactured articles from the United States in 1901 was \$395,144,030, as compared with \$441,406,942 in 1900. In the latter year the percentage of manufactured goods to the total exports was 30.38 per cent., while in 1901 it was 27.48 per cent. To a certain extent these figures are indicative of the activity in the manufacturing interests of the United States.

By comparing the exports of different manufactured articles for the years 1901 and 1900, a fair idea may be gained of the condition of trade in these commodities. The comparative exports are shown in the accompanying table:

EXPORTS OF MANUFACTURED ARTICLES FROM THE UNITED STATES, 1901 AND 1900.

Articles.	1901.	1900.
Agricultural implements.....	\$16,714,306	\$15,979,909
Books, maps, etc.....	3,633,069	3,264,772
Cycles and parts.....	2,599,237	3,061,061
Cars, carriages, etc.....	8,262,164	7,335,740
Clocks and watches.....	2,325,842	2,104,319
Copper ingots.....	31,692,563	55,285,047
Cotton cloth, colored.....	7,125,998	5,083,013
Cotton cloth, uncolored.....	12,759,286	9,389,087
Fibre manufactures.....	4,418,406	4,378,788
Glass and glassware.....	2,087,043	2,042,683
Gunpowder and explosives.....	1,965,875	1,766,725
India rubber manufactures.....	3,326,016	2,808,516
Electrical and scientific apparatus.....	6,417,629	6,785,988
Steel rails.....	8,678,781	10,885,416
Structural iron and steel.....	3,031,861	3,570,769
Builders' hardware.....	8,831,149	9,782,402
Steel wire.....	4,805,688	4,604,047
Electrical machinery.....	5,623,442	5,286,224
Metal working machinery.....	3,066,871	6,210,594
Pumps and pumping machines.....	2,024,987	2,760,812
Sewing machines and parts.....	3,749,584	4,510,231
Locomotive engines.....	4,061,434	4,465,627
Typewriting machines.....	2,987,762	2,736,485
Miscellaneous machinery.....	18,665,182	23,852,066
Iron pipes and fittings.....	5,116,904	5,995,849
Boots and shoes.....	5,997,463	4,626,266
Musical instruments.....	3,598,645	2,112,516
Refined mineral oils.....	65,482,859	66,307,621
Paper manufactures.....	7,324,073	7,088,014
Tobacco manufactures.....	5,977,189	5,736,167
Household furniture.....	4,122,618	4,126,186
Woollen manufactures.....	1,581,972	1,429,733

The table shows that the greatest diminution in export values was in iron and steel and in copper, the former showing a decline of \$27,093,683 and the latter a decline of \$23,592,484, though there was an increase in quantity of about 500,000 pounds. The great demand for iron and steel in the United States (see IRON AND STEEL) and the low prices for these commodities in Europe explains the falling off in exports in this department, while the other decreases are not of a serious character. Boots and shoes, agricultural implements, musical instruments, cars and carriages, clocks and watches, all show gains, while cotton cloths, the export of which to China was stopped by the outbreak of 1900, are restored to a position even better than in 1899, when the exports aggregated \$19,704,713.

As regards manufacturing conditions in England, the year 1901 was on the whole rather more favorable than its predecessor. There has been considerable discussion about the capture of British markets by American and German manufacturers; but this has in many cases served to call attention to defects in equipment and organization, and has resulted in the adoption of new machinery and methods, a part of which at least are American in their origin. In the engineering trades, as the English style the various manufactures of steel and iron, there has been activity, though prices have been generally low. A concise statement of conditions in various branches of this industry is given in the annual *Engineering Trades Report* published by Matheson and Grant, of London, from which some extracts follow:

"Locomotives and Rolling Stock.—All the manufacturers have been busy during the past year at good prices; but the very keen demand for engines which benefited them has slackened, and orders for delivery over the next year can be placed on slightly easier terms. The tendency of railway engineers is still toward greater power, and the ingenuity of designers is taxed to get more haulage force out of engines whose size is necessarily limited by the standard gauge. All this encourages the use of high-class materials, and disinclines English firms from adopting American and Continental methods. Electric traction is coming more into evi-

dence, and the special requirements of tunnel railways will pave the way to a gradual revolution in the future on the main lines where the generating power en route by steam boilers seems likely to become obsolete. The railway carriage and wagon builders feel secure for the coming year, as the orders in hand and immediately in view will occupy the full manufacturing capacity of the country.

"Mechanical engineers and ironfounders are too numerous and various to be dealt with as a whole, but generally it may be said they are well engaged. In many districts, though not in all, they have to share the vicissitudes of the local industries. Motor carriages have received more attention in France than in England, where the use of benzoline fuel seems not to be so well understood. America has not as yet done much in this direction. The great variety of her roads and the extremes of climate will probably lead to corresponding variations of design. The rivalry between steam engines and gas engines for generating electricity is becoming keener now that the economy in fuel claimed for gas engines is accepted.

"Agricultural engineers do not consider their trade quite satisfactory, and if they had to depend for profit solely on the machines and implements that come strictly within this designation most of them would have to reduce their establishments. Trade takes new courses; export to the colonies is not the same, and American competition is stronger than ever, especially in harvesting machinery. In Germany financial troubles limit expenditure at home and encourage low prices for export, but seem likely also to restrict the long credits to buyers in Russia and southeastern Europe. In regard to portable and traction engines, neither American nor Continental makers give a quality equal to that which is associated with the leading English firms.

"In conclusion, it may be affirmed that, notwithstanding the fears of those whose profits decline and who feel the pinch of competition, the engineering trades are still among the most certain and best planted of the national industries. If left unrestrained they will continue to flourish so long as fuel and iron are available as at present. The constant advice of consuls and others abroad who have no share in the risks and responsibilities of manufacturers here to adopt German methods, including cheap prices and long credits, has happily not yet taken effect and caused the deterioration of quality which would be the real outcome of such a change. There are few English manufacturers who have not dearly bought in past years their experience of such methods. They are not disposed to renew it."

For detailed account of trade conditions and progress in other manufacturing industries, see COPPER, COTTON, IRON AND STEEL, SHIP-BUILDING, SILK MANUFACTURE, SUGAR INDUSTRY, WOOL AND WOOLLEN MANUFACTURE. See also GREAT BRITAIN and articles on other foreign countries.

MAPLESON, JAMES HENRY, English operatic impresario, died in London, November 14, 1901. He was born in London, May 4, 1830, and began his musical education at the Royal Academy of Music, going subsequently to Italy to study under Mazzucato. After some desultory work as a vocalist he became a violinist, and played in the Royal Academy's orchestra. Upon losing his singing voice he embarked in operatic management, and in 1861, after five years as assistant and adapter, he took the management of the Lyceum Theatre, where he brought out *Il Trovatore*, with Tietjens, Albani, Guiglini, and Delle Sedie in the cast. In the course of his long career he managed half a dozen theatres in London, and introduced, among other famous singers, Christine Nilsson, with whom he associated Campanini, Mario, Gerster, Trebelli, Scalchi, and Patti. In 1878 he first took an opera company to New York City, and his last season in America was that of 1885-86, when his principal singers were Hauk, Nordica, Fohström, Lablache, Ravelli, Gianinni, De Anna, Del Puente, Cherubini, and Vaschetti. His last season in London was in 1888, at the Covent Garden Theatre. Invariably optimistic and given to new experiments, Mapleson's career was a series of successes and failures; but he unquestionably did much for grand opera in both England and America.

MARCONI, WILLIAM, electrical engineer, demonstrated in 1901 the practical utility of his inventions in wireless telegraphy by successfully transmitting signals across the Atlantic Ocean and by other tests. He was born at Marzabotto, near Bologna, Italy, in 1875, of English and Italian parentage, and was educated at Leghorn and at the University of Bologna, where he began the experiments with which his name is now identified. The first tests were made in 1895 on his father's estates near Bologna, and in 1896 he went to England, where he made the acquaintance of Sir William Preece, and worked with him for some time. The two succeeded in sending messages across the channel from Penarth to Weston, and soon afterwards the Italian minister of marine interested himself in Mr. Marconi's work. Under his direction messages were sent to a warship lying ten miles off shore at Spezia. Mr. Marconi's apparatus was installed on the ships of the British navy,

and was successfully used in the naval manœuvres of 1899. For the description of recent experiments made by him see **WIRELESS TELEGRAPHY**.

MARGALL, FRANCISCO PI Y, Spanish politician, died in Madrid, November 29, 1901. He was born at Barcelona in 1820, and was educated in law. Engaging in politics, he took part in an unsuccessful uprising (1866), at the close of which he fled to France and remained there until the abdication of Queen Isabella in 1868. Under King Amadeus he was the leader of the opposition in the Cortes, and upon the abdication of the king in 1873 he became minister of the interior under President Figueras. In a short time Figueras resigned, and Señor Margall was elected to the presidency, but was not able to suppress the revolutionists, and failing to establish himself by dictatorial means, was compelled to resign. For some time after the accession of Alfonso XII. in 1874 he lived in retirement, but was later returned to the Cortes, where he became the leader of the Radical Republicans.

MARRIAGE, MEDICAL CONTROL OF. It has never been found practicable to control fancy, sentiment, and passion so thoroughly as to place marriage under entire medical control for the purpose of propagating healthy offspring. The marriage of the insane, of idiots, and of degenerates is but slightly impeded, in spite of laws to govern such cases enacted in many countries, largely through the inability of priests and magistrates to determine the mental condition of candidates for wedlock. In February, 1901, a bill was introduced into the Minnesota legislature which provides that all applicants for a marriage license shall submit a certificate from a physician showing that they are fit to enter the marriage state, and also provides that no insane, epileptic, or idiotic person, or one afflicted with a loathsome disease, shall be allowed to marry. The penalty for violation of the law by the contracting parties is a fine of \$1,000 or five years in the penitentiary, or both, and applies also to the clergyman or justice who performs the ceremony. After amendment, by which the prohibition was made less broad and by which feeble-minded persons over 45 were permitted to marry, the bill passed the legislature in March. The Colorado House of Representatives considered in 1901 a bill which was introduced in that body providing for the appointment of a board of medical examiners whose duty it shall be to decide upon the fitness of all applicants for a marriage license, and without whose permission no such license shall be granted. The board is to sit ten days in each month. Certain diseases and certain facts in family histories shall be bars to marriage after the passage of the act. The fee for the examination is fixed at fifteen dollars. After January 1, 1902, all marriages between first cousins in the State of Pennsylvania will be illegal, and any contracted after that date will be void.

MARTINIQUE, an island in the West Indies, lying between the Leeward and Windward groups, is a dependency of France. Its area is 381 square miles, and the population at the end of 1899 was estimated at 194,272. The principal town is St. Pierre (population, 25,792) and the capital Fort-de-France (population, 17,274). The government is in the hands of a governor and an elected general council, and is represented at Paris by a senator and two deputies. The local budget for 1900 balanced at 5,729,793 francs, while the amount expended for the colony by France, according to the budget of 1901, was 2,270,758 francs. Sugar, cacao, coffee, tobacco, and rum are the chief products. The total imports in 1899 amounted to 27,004,526 francs, about 50 per cent. being from France, and the exports in the same year were 26,603,147 francs, 24,212,270 francs going to France. The tonnage entering and clearing in 1899 was 629,349.

MARYLAND, a Middle Atlantic State of the United States, has an area of 12,210 square miles. The capital is Annapolis. The population in 1900 was 1,190,050, while in June, 1901, as estimated by the government actuary, it was 1,205,000. The populations of the two largest cities in 1900 were: Baltimore, the sixth largest city in the United States, 508,957; and Cumberland, 17,128.

Finance.—The receipts of the treasury for the fiscal year ending September 30, 1901, were \$3,243,154.12. Disbursements for the year aggregated \$3,120,626.37. There was in the treasury on September 30, 1900, \$849,885.16 available for current expenses, and \$229,589.14 belonging to the fund's account. The balance in the treasury at the close of the fiscal year 1901 was \$972,412.91, of which there was available for current expenses, \$521,787.57. The funded debt of the State at the close of the fiscal year was \$6,509,326.13, an increase of \$200,000 over the year previous. The total value of all property in the State as returned for taxation was \$643,812,408, an increase of \$27,092,626 over the year previous.

Industries.—From the census reports of 1900, it appears that there has been a steady growth in the manufacturing industries of Maryland since 1850. In this time, the population increased from 583,034 to 1,188,044, or 103.8 per cent., while the average number of industrial wage-earners advanced from 30,212 to 108,361, or 258.7

per cent., embracing in 1900, 9.1 per cent. of the total population. The amount of actual capital invested in 1900 in mechanical industries, exclusive of capital stock, was \$163,422,260, and the gross value of the products, \$242,752,990, while the net value, exclusive of products re-used in the process of manufacture, was \$139,132,948. The industries of Maryland are due to its agricultural products and to the shipping facilities afforded by its railroads and ports. Upon the first factor depends the State's most important industry, the canning and preserving of fruits and vegetables, with an output in 1900 valued at \$11,996,245, an advance of 66.7 per cent. since 1890; also the making of flouring and grist-mill products to the value of \$8,035,343, and the manufacture of tobacco, valued at \$7,054,159. Dependent upon the increase of tobacco culture and other forms of agriculture is the manufacture of fertilizers, with a product in 1900 valued at \$5,481,905.

Iron and steel manufactures occupy second rank, with an output in 1900 valued at \$8,739,405, an increase since 1890 of 204.6 per cent.; one of the oldest industries of the State. This declined with the development of the Lake Superior ore district, and has only recently been revived. The ores are imported largely from Cuba, and the coal and coke from Pennsylvania and West Virginia. Most of the steel rails produced are shipped abroad to Asia, Africa, Australia, and London. Foundry and machine-shop products, to the value of \$8,443,547, rank third among the industries of the State. Slaughtering and meat-packing, with a product valued at \$6,209,857, the manufacture of cotton and of woollen goods, with products valued in 1900 respectively at \$5,423,257 and \$1,218,378, are also of importance. Baltimore is the largest producer of cotton duck in the United States. The ship-building industry, important early in the century, declined with the introduction of steel construction, but has been revived of late, the product in 1900 being valued at \$3,299,491, an increase of 139.5 per cent. since 1890. Other important industries report value of products as follows: Planing mills, \$3,753,083; furniture making, \$2,976,494; manufacture of lumber and timber products, \$2,650,082; paper and wood pulp, \$2,589,540; and oyster canning and preserving, \$2,417,331.

Ballot Law.—An extra session of the legislature was called by Governor Smith on March 6, 1901, for the purpose, as stated by the Democratic legislative majority, of making needed reforms in the ballot laws of the State. For it was asserted that under the ballot law as it stood, non-residents imported into the State by campaign managers at the season of election, could not be restrained from voting, and there was, furthermore, no law permitting the elimination of the grossly ignorant and undesirable vote of the State. These reasons for the necessity of a special session of the legislature were denied by the Republicans, who claimed that the sole purpose of the session was to amend the ballot law so as to throw out the bulk of the Republican negro vote and thus insure the reelection to the United States Senate in 1902 of Mr. Arthur Pue Gorman, who had retired from the Senate in 1899, having been defeated for reelection. The ballot law, as finally passed, appeared on its face to be eminently fair. It made severe rules to prevent those persons from voting who had not a *bona-fide* residence in the State, and it formulated a ballot law proper, necessitating a limited amount of intelligence on the part of the voter. The registration part of the law provided that all persons who had left the State prior to the passage of the ballot act should, in person, within thirty days after the passage of the act, and all persons who had left the State subsequent to the ballot act, must, at the time of leaving or thereabouts, make sworn affidavit to the county authorities that they had not intended and did not intend to give up their legal residence therein. And unless such persons did actually return to the State and take up and continue their residence in the State for at least six months prior to the election, they should not be entitled to vote. This clause of the law was asserted by the Democrats to be absolutely necessary to stop the extensive colonization of voters hitherto conducted under the auspices of the Republicans.

The ballot law proper provided that the names of candidates for office should be arranged alphabetically under the designation of the office for which they were nominees, and to the right of the name of each candidate should be added the designation of the party which the candidate represented; but no other party emblem or insignia of any kind should be allowed upon the ballot. Under this law, the old rule, placing all the candidates of each party underneath their party emblem, was repealed, as was also the provision that the ballot might contain the names of the president and vice-president nominated, in addition to the names of Presidential electors. So-called straight voting was also abolished under the new law, and the voter was required to mark an X against the name of every candidate he voted for. It was at first intended by the dominant party in the legislature to repeal that provision of the old law which stipulated that for at least four days prior to the election, accurate sample copies of the ballots should be conspicuously posted in each voting precinct so that voters might familiarize themselves with the plan of the ballot. But the proposal to repeal this clause aroused so much opposition on the

ground that it would be discriminating against the ignorant but honest negro vote, that it was allowed to stand. In the same way, a proposed addition to the new law to the effect that names of candidates might be placed in any order on the ballot, irrespective of the office for which they were nominated, as well as irrespective of the party to which they belonged, was abandoned. Under the old law, a voter who was physically disabled or who could not read or write was permitted to ask the election clerks to read his ballot to him and to mark it as he directed. By the new law, a voter was forced to satisfy the judges that he was blind or otherwise physically disabled before the clerks were allowed to help him; and even then the clerks were not to be allowed to read his ballot to him or in any way to indicate to him its typography, but only to mark it for him as he directed. By the old law, a ballot was only to be thrown out, generally speaking, if it was impossible to make a fair guess as to how the elector intended to vote. By the new law, a ballot was to be thrown out, generally speaking, if it was incorrectly marked in any way.

Census Law.—In connection with the ballot law the Assembly directed that a new census should be taken of the State of Maryland. Under the recent federal census, as alleged by the Assembly, the results that had been announced from some of the counties were so totally contrary to the popular belief, and would result in such undue representation in the legislature of certain sections of the State, that a new census was ordered to begin on the 1st day of May and be completed on the 10th of June. At this census it was provided, among other things, that the enumerators should ascertain each inhabitant's length of residence in the State, his color, and educational qualifications, and they should not count as *bona-fide* residents of the State those temporarily employed in the State or those whose actual residence was outside of Maryland. And the enumerators, furthermore, were ordered to look up every registered voter, and where these could not be found in their precincts, to find out where they were, and to forward to the governor lists showing the total number of males over twenty-one years of age in each election district, and whether or not they were registered voters. And it was directed that on the basis of the returns of this census the governor should reapportion county representation in the House of Delegates. The Democratic majority in the Assembly stated in defense of these rigid provisions for the census that they were necessary in order to prevent the further importation of voters into the State by the Republicans; the Republicans, on the other hand, claimed that the census law was only part of the general scheme to elect Mr. Gorman to the Senate.

Sewerage System for Baltimore.—An act was passed creating a commission to be known as the Sewerage Commission of Baltimore, with power to adopt and construct a sewerage system for the city. This commission was to have entire charge of all matters pertaining to the construction of the system, with authority to appoint and remove at pleasure all the employees except the employees of contractors. Nevertheless, the employees of contractors and all other employees, except those hired for their technical skill and ability, were to be registered voters of Maryland. No crude sewage was to be allowed to flow into Chesapeake Bay or its tributaries, and no diluted sewage should be permitted so to flow except upon a certificate of competent chemists that such sewage was free from impurities and would not be injurious to the fish and oyster industries. Upon a consent of the legal voters of Baltimore, the mayor was authorized to issue \$12,000,000 of bonds for the purposes of construction; but if the legal voters did not authorize this issue, then the entire legislative act was to be null and void.

Elections.—The elections of Maryland in November, the first to be held under the new ballot law (see paragraph Ballot Law), resulted, as had been anticipated, in placing a Democratic majority in the State legislature, which meets on January 1, 1902, and whose most important immediate duty is to elect a United States Senator to succeed George L. Wellington, Republican, whose term expires March 4, 1903. As shown by the election, the legislature will consist of 9 Republicans in the Senate and 44 in the House, and of 17 Democrats in the Senate and 51 in the House, thus giving Democratic majorities of 8 in the Senate and 7 in the House, or a Democratic majority on a joint ballot of 15. When the returns of the elections had been announced the Republicans stated that while the ballot law had disenfranchised 30,000 Republicans, as against 12,000 Democrats, the State had really gone Republican by some 10,000 majority; but that the Democrats, in order to upset this majority, had practiced extensive frauds in counting the ballots, and that the election would accordingly be contested and taken to the courts. Pending this appeal it appeared evident that the legislature would elect Arthur Pue Gorman, Democrat, as senator from Maryland as soon as it convened.

Besides members of the legislature, there were elected in November a clerk of the Court of Appeals and a State comptroller. For State comptroller, J. W. Hering (Dem.) received 96,477 votes, while his opponent, H. S. Platt (Rep.) received 96,386 votes, thus giving Hering a plurality of 121. For clerk of the Court of Appeals,

Thomas Parran (Rep.) received 96,658 votes, and his opponent, J. F. Turner (Dem.), 95,269, thus giving the Republican candidate a plurality of 1,389 votes.

State Officers.—Elected in 1899 for four years: Governor, John Walter Smith, Democratic, term ends January, 1904; secretary of state, Wilfred Bateman; treasurer, Murray Vandiver; comptroller, term two years, Dr. Joshua W. Hering; attorney-general, term four years, Isidor Rayner; superintendent of education, term four years, M. Bates Stevens; commissioner of insurance, Lloyd Wilkinson; commissioner of public lands, E. Stanley Toadvin.

Court of Appeals—Chief justice, term fifteen years, expires 1902, James McSherry; associate justices, David Fowler, A. Hunter Boyd, Henry Page, I. Thomas Jones, John P. Briscoe, S. D. Schmucker, and James A. Pearce.

Congressional Representatives (57th Congress). In the House—W. H. Jackson, from Salisbury; A. A. Blakeney, from Franklinville; Frank C. Wachter, from Baltimore; Charles R. Schirm, from Baltimore; Sydney E. Mudd, from Laplata; and George A. Pearce, from Cumberland—all Republicans. In the Senate—George L. Wellington (until 1903), from Cumberland, and Louis E. McComas (until 1905), from Williamsport—both Republicans.

MASHONALAND. See RHODESLA.

MASSACHUSETTS, a New England State of the United States, has an area of 8,315 square miles. The capital is Boston. Massachusetts was one of the original thirteen States. The population in 1900 was 2,805,346, while in June, 1901, as estimated by the government actuary, it was 2,866,000. The populations of the five largest cities in 1900 were: Boston, the fifth largest city in the United States, 560,892, an increase of 112,415 since 1890; Worcester, 118,421; Fall River, 104,863; Lowell, 94,969; and Cambridge, 91,886.

Finance.—The gross funded debt on January 1, 1902, was \$77,696,635.30. Of this amount, \$16,738,240.92 was covered by payments into the sinking fund, leaving a total net funded debt of \$60,958,394.38. But of the gross funded debt, \$51,958,412 was nominal or contingent debt only, the payment of this portion being guaranteed by sinking funds provided by a direct annual tax of the commonwealth on the cities and towns directly interested in the objects for which the debt was created. The total value of taxable property in the commonwealth, by the last statement of the tax commissioner and secretary of state, was \$3,981,876,499. Of this amount \$2,370,550,196 was taxable real estate, and \$1,611,326,303 was taxable personal estate. At the same time the estimated value of the property of the commonwealth proper was estimated at \$23,481,540.96.

Industries.—The full census reports for the industries of Massachusetts had not been made public by the end of the year 1901, but the totals of the industries for 1900 were given as follows: The amount of capital, exclusive of capital stock invested in the 29,180 manufacturing establishments reporting, was \$823,264,287. This sum was made up of the following itemized values: Amount invested in land, \$57,284,347; in buildings, \$116,410,327; machinery, tools, and implements, \$201,933,253; in cash and sundries, \$447,636,360. As compared with 1890, the total capital invested in industrial establishments showed an increase of nearly \$200,000,000, the amount in 1890 being \$630,032,341. In 1890 the number of salaried persons in the establishments was 37,912, drawing salaries amounting annually to \$33,826,172. In 1900 both the number of salaried persons and the total amounts paid for salaries had decreased, but the former in much larger ratio than the latter. The total number of salaried persons in 1900 was 27,860, and the total amount paid in salaries, \$31,257,630. The average number of industrial wage-earners in 1900 was 497,448, with wages amounting to \$228,040,442. Women wage-earners numbered 143,109, with salaries amounting to \$45,630,890. Children to the number of 12,556 were employed with wages amounting to \$2,453,728. The number of men wage-earners was 341,783, with wages amounting to \$179,955,824. The total gross value of the products of industrial establishments in 1900 was \$1,035,198,989, as against \$888,160,403 in 1890. In both 1890 and 1900 Massachusetts was the fourth State in industrial importance in the Union.

Legislation.—The Massachusetts legislature met on January 2, 1901, and was prorogued on June 19. Among the various acts passed were the following: An act providing that after proceedings had been begun against a corporation for the collection of overdue taxes, the interest on such taxes should be raised from 6 to 12 per cent. until they were paid. An act providing that the bonds of the Boston and Maine Railroad, received by the State in accordance with an act of 1900, in exchange for the 50,000 shares of Fitchburg stock previously held by the State, should be paid into the sinking fund. An act directing that in estimating the value and property of the New York, New Haven and Hartford Railroad, the tax commissioners might make an equitable allowance for the value of those shares of the railroad stock that had been lawfully issued by the New Haven road in exchange for the shares of any other railroad taxed by Massachusetts on its franchises and property. An act directing that corporations engaged in Massachusetts in the construction, erection,

alteration, or repair of any building, bridge, railroad, or other structure, but incorporated in some other State, should be put on the same footing with domestic companies, by being obliged before commencing business to appoint in writing the commissioner of corporations to be their attorney, upon whom all lawful legal process might be served. Street railway companies were authorized to carry newspapers and the United States mail. The Massachusetts highway commission was authorized to contract a loan of \$500,000 on 4 per cent. bonds redeemable in thirty years. A law in the interest of veterans of the Civil War provided that ex-soldiers and sailors holding office in the public service of the State or of any city or town, could be removed only after a full hearing and upon orders giving full written reasons for the removal. The governor was directed, with the consent of the council, to appoint five persons, two of whom were to be women, to constitute a Board of Prison Commissioners. The offices of commissioners of prisons and general superintendent of prisons were abolished, and the powers and duties formerly possessed by them were directed to devolve upon the board of commissioners created by the act. Dealers in tobacco were forbidden to sell cigarettes to any person under 18; and no person except the minor's parents or guardian was to be allowed to give a cigarette to any minor under 18. In conjunction with a similar law passed by the legislature of New York, the boundary line between Massachusetts and New York was finally fixed, from the northwest corner of Connecticut to the southerly line of Vermont. The law of imprisonment for non-payment of poll taxes was amended by providing that a person could be imprisoned for only 7 instead of, as previously, 20 days. An act for the regulation of smoke from manufacturing establishments provided that in any city the electors might declare in force the following regulations: that except upon the granting of permits by the local authorities, the emission of dark, dense smoke for more than 5 minutes, or the emission of such smoke during 12 per cent. of any continuous period of 12 hours, within a quarter of a mile of any building, should be prohibited. The punishment for kidnapping, when done with intent to extort money or ransom, was increased from not more than ten, to not more than twenty-five years' imprisonment. An act for the safety of passengers riding in elevators provided that before January 1, 1902, all freight and passenger elevators in buildings should be provided with safety appliances, unless exemption was granted by the proper inspectors and commissioners. The Metropolitan Water and Sewerage Board was authorized to borrow in the name of the commonwealth \$13,000,000 in addition to the \$27,000,000 loan authorized in 1895. An act for the protection of gamblers in bucket shops enacted that any person who had placed orders to buy or sell securities through a broker either directly or indirectly might recover from said broker the amount of "margin" he had placed with the broker, providing, however, that no stock had been actually bought or sold by the broker, and that the transaction had been concluded without any actual purchase and sale of securities. A curious act, intended apparently on the one hand to prevent coercion of dealers by manufacturers, and on the other hand to act liberally in the matter of such coercion, enacted that no firm doing business in Massachusetts should make it a condition of the sale of its goods that the buyer should not deal in the goods of any other firm; but from the provisions of this act, contracts made by buyers with agents were specifically excluded. Additional power was given to the civil-service commissioners in case of violation of the civil-service acts and rules of the State. The sale of food containing antiseptic or preservative ingredients was with certain exceptions prohibited. Articles of food and drink were directed to be labeled so as to show the substances composing them, and the manufacturer's name was also directed to be placed upon the packages. City councils were authorized, provided that the act was accepted by the voters, to place on half-pay pension policemen injured while in the service. An act for the regulation of political party caucuses directed that, except for special elections, all caucuses were to be held on a day named by the general political state committee. At this caucus all delegates were to be elected, and candidates nominated, and the convention was not to be held within seven days succeeding the caucus. At a special session of the legislature held on November 13, the recommendations for the revision of the statutes suggested by a special committee of 50 previously appointed was accepted, and appropriations were made for the printing of 7,500 copies of the statutes as thus revised.

Elections.—On January 16, 1901, the Massachusetts legislature, reelected by an overwhelming vote United States Senator George F. Hoar to succeed himself for the full term ending March 4, 1907. Senator Hoar received 29 votes in the Senate and 169 in the House as against 8 in the Senate and 48 in the House cast as a compliment to Richard Olney, former secretary of state under Grover Cleveland. No opposition was manifested to Senator Hoar in his own party in the legislature, and sentiment appeared to be practically unanimous throughout the State that he should be reelected. Senator Hoar served as a representative in Congress from 1869 to 1877, and has since served continuously in the Senate, his reelection in 1901 mark-

ing the beginning of his fifth senatorial term. In the debates which took place in the Senate and in the country at large concerning the Philippine policy of the administration, mainly prior to the national election of 1900, Senator Hoar, although opposing the Democratic nominee, was perhaps the most outspoken and vigorous of the opponents of the President. For this reason, much favorable comment was generally expressed that Massachusetts had determined to continue in service so eminent a statesman as Senator Hoar, notwithstanding his opposition to a generally popular policy of the national administration. At the regular elections in November, the full Republican State ticket was elected headed by W. Murray Crane. The total vote for governor was: Murray Crane (Rep.), 185,809, and Josiah Quincy (Dem.), 114,362, thus giving a Republican plurality of 71,447. In the presidential election of 1900, when the whole vote was 414,251, the Republican plurality for president was 81,869. In 1901 the whole vote was 324,520, and both because the vote in 1901 was so much smaller than that in 1900, and because the year following the presidential election is usually an off year for the party in power, the large plurality given to Governor Crane was the more remarkable. His opponent, Mr. Quincy, was an able and experienced politician, and yet so overwhelming was the sentiment in favor of re-electing Governor Crane for a third continuous term that no campaign for him was found necessary, not a rally was held in his behalf, and he himself did not make a single campaign speech or issue a single campaign document. In his two terms of office, Mr. Crane has gained much prominence by acting the part of the purely business governor so-called, strangling grab-bills, reducing the public expenditure, and refusing to allow the State debt to be needlessly increased. The remainder of the ticket elected was as follows: Lieutenant-governor, John L. Bates; secretary of the commonwealth, William M. Olin; treasurer and receiving general, E. S. Bradford; auditor of accounts, Henry E. Turner; attorney-general, Herbert Parker.

State Officers.—Elected for the third time: Governor, W. Murray Crane, Republican, for one year, term ends January, 1903; lieutenant-governor, John L. Bates; secretary of state, William M. Olin; treasurer, E. S. Bradford; auditor, Henry E. Turner; attorney-general, H. M. Knowlton; secretary of education, Frank A. Hill; secretary of agriculture, James W. Stockwell; commissioner of insurance, F. L. Cutting. Supreme judicial court: Chief justice, holding office for life, Oliver Wendell Holmes; associate justices, Marcus P. Knowlton, James M. Morton, John Lathrop, James M. Barker, John W. Hammond, and William C. Loring.

Congressional Representatives (57th Congress).—In the House—George P. Lawrence, from North Adams; Frederick H. Gillett, from Springfield; John R. Thayer, from Worcester; C. Q. Terrell, from Natick; William S. Knox, from Lawrence; William H. Moody, from Haverhill; Ernest W. Roberts, from Chelsea; Samuel W. McCall, from Winchester; J. A. Conroy, from Boston; Henry F. Naphen, from Boston; Samuel C. Powers, from Newton; William C. Lovering, from Taunton, and William S. Greene, from Fall River—all Republicans except J. R. Thayer, J. A. Conroy, and Henry F. Naphen, Democrats. In the Senate—Henry Cabot Lodge (until 1905), from Nahant, and George Frisbie Hoar (until 1907), from Worcester—both Republicans.

MATABELELAND. See RHODESIA.

MATHEWS, ALBERT P. See PHYSIOLOGY, CHEMICAL.

MATHEWS, General Sir LLOYD WILLIAM, British statesman in Zanzibar, died there, October 11, 1901. He was born in England in 1850, and entered the Royal Navy in 1863. After serving in the Ashanti War in 1873-74 and on the East Coast of Africa, where he took part in suppressing the slave traffic, he entered the service of the Sultan of Zanzibar in 1878. The Sultan gave him the title of general, taking him into his confidence and entrusting him with the organization of the native army. When Great Britain assumed a protectorate over Zanzibar in 1890, General Mathews was appointed British consul-general, but never accepted that honor, preferring to remain in the Sultan's immediate service. As prime minister of Zanzibar he organized the whole of the new administrative machinery, bringing order out of the old state of affairs; and for this service he was made in 1894 a K.C.M.G. by the British government.

MAURITIUS, an island in the Indian Ocean 500 miles east of Madagascar, constituting a British crown colony, has an area of 705 square miles, and at the end of 1900 its resident population was 380,040, of whom 261,027 were of East Indian birth or descent. The white inhabitants are largely French Creoles. The Seychelles, Rodriguez, Diego Garcia, and a number of other islands in the Indian Ocean, are dependencies of Mauritius; their total area is 172 square miles and population 23,341. The capital of Mauritius is Port Louis, with a population in 1900 of 53,978. The colony is administered by a governor (Sir Charles Bruce since 1897), assisted by executive and legislative councils, both being made up partly of elected members; the administration is much more representative than that of the ordinary crown

colony. The educational system was remodelled by an ordinance of August, 1900, by which a department of instruction was created with two branches, one controlling the Royal College and the high schools and the other the primary and grant-schools. The revenues of the colony increased from Rs. 9,066,313 (the rupee is worth 32.4 cents) in 1899 to Rs. 9,179,975 in 1900, and the expenditures from Rs. 8,407,227 to Rs. 8,568,944. The public debt is £1,189,284. The imports decreased in value from Rs. 28,180,979 in 1899 to Rs. 23,052,975 in 1900 and the exports increased from Rs. 27,381,161 to Rs. 31,575,276. The trade is chiefly with India, and the principal article of export is sugar, the value of which reached Rs. 29,000,000 in 1900. Other articles of export are cocoanut oil, aloe-fibre, rum, and vanilla. In 1900 there were 105 miles of railway and 135 miles of telegraph. A submarine cable connects both the Seychelles and Mauritius with the African coast at Zanzibar.

The bubonic plague, which appeared in Mauritius in 1899, has been effectually stamped out, but malaria has increased, the colonial secretary reporting in 1901 that three-fourths of the population were suffering from malaria, and that 34.5 per cent. of the deaths were due to that cause. The colonial secretary called attention to the serious social problem raised by the condition of the Creole population, who are constantly growing poorer and are being driven out of work by the competition of Indians and Chinese. As a remedy the wholesale emigration of the Creoles to South Africa was suggested.

The Seychelles islands, the principal dependency of Mauritius, lie about a thousand miles to the north and have a population of 20,275 and an area of 148 square miles. The revenue amounted in 1900 to Rs. 399,311 and expenditures to Rs. 351,919. In the same year the imports were valued at Rs. 980,911 and the exports, mostly vanilla and cocoanut oil, Rs. 1,036,161. The public debt was Rs. 300,000.

MAYO-SMITH, RICHMOND, American educator, died in New York City, November 11, 1901. He was born in Ohio in 1854 and graduated at Amherst College in 1875, after which he spent two years at the universities of Berlin and Heidelberg in the study of political science and government. In 1877 he was made adjunct professor of political economy at Columbia University and full professor a short time afterward. Professor Mayo-Smith's most notable work was in statistics, on which subject he published *Sociology and Statistics* (1895) and *Statistics and Economics* (1889). Besides these he published in 1890 *Emigration and Immigration*.

MEASLES. While the mortality from measles in children under 2 years of age is about 20 per cent., in those over that age it is very small, ranging from 14 per cent. in institution cases to zero, in many tables of statistics. The average in all ages is from 4 to 6 per cent. In most fatal cases the cause of death is broncho-pneumonia. Assistant Surgeon Dunlap Moore, of the United States quarantine service, who was stationed at Nome during 1901, states that measles is epidemic, and has attacked one-third of the native population at Cape Nome, Prince of Wales, Nome, Port Clarence, St. Michaels, Kuskokwim, Unalaska, Pribyloff Islands, Nunivaki Island, St. Lawrence Island, and along the Yukon River. The mortality from this and other diseases is very great, and the natives are rapidly disappearing.

MEDICAL PROGRESS IN 1901. Interesting research and corroborative experiment have served to convince many doubters of the rôle played by the mosquitoes in the dissemination of malaria and yellow fever. (See **INSECTS AND THE PROPAGATION OF DISEASES AND YELLOW FEVER**.) Determined effort has been made to devise means for limiting if not eradicating these diseases. Substantial progress has been made in the matter of controlling the spread of "the great white plague." (See **TUBERCULOSIS**.) Our knowledge of the tropical diseases has been vastly increased by study of disorders prevailing in Porto Rico, the Philippines, and Hawaii, as well as of those transplanted to the United States by returning troops. (See **CAVITE FEVER**; **COCHIN-CHINA DIARRHŒA**; **DYSENTERY**; **FILARIA**; **LEPROSY**; **MALTA FEVER**.) The methods of preventing or antagonizing disease by the use of antitoxins have been subjected to repeated tests and their number has been increased by ardent and devoted physiologists. (See **SERUM THERAPY**.) A repetition of the previous year's experience with smallpox occurred in 1901, though the epidemic of the disease was less severe, owing to very numerous revaccinations. (See **SMALLPOX AND VACCINATION**.) A smaller number of new drugs than usual was brought to the attention of clinicians in 1901, and the proving of comparatively recent additions to the *materia medica* has been less frequent and has excited less interest than in past years. (See **ACETOSPIRIN**; **ADRENALIN**; **ANTICELTINA**; **BISMUTOSE**; **GASTERINE**; **LECITHIN**; **NEODERMIN**; **PANCREON**; **SUBLAMINE**; **TRIFERRIN**.) The use of sunlight, electric light and the Röntgen Rays in the treatment of malignant disease has been enthusiastically advocated and practiced, with considerable success. (See **PHOTOTHERAPY** and **RÖNTGEN RAYS**.) Other medical news or statistics for the year will be found under their proper titles.

MEDICINE, AMERICAN ACADEMY OF, was founded 1876, largely as a protest against the then prevailing low scale of requirements for admission to the medical profession. The members must possess in addition to the degree of M.D. that of B.A., or have taken a course of study fairly equivalent to the B.A. course. At present the Academy is devoted to the study of sociologic questions in which physicians are professionally interested, topics which do not come within the scope of the American Medical Association. The bi-monthly *Bulletin* issued by the Academy contains the papers and translations of its own organization, of the Association of American Medical Colleges, and of the National Confederation of State Medical Examining and Licensing Boards. Membership in 1901, 782 fellows; secretary, Charles McIntire, Easton, Pa.

MEEHAN, THOMAS, horticulturist, died in Philadelphia, Pa., November 19, 1901. He was born at Potter's Bar, England, in 1826, and came to the United States in 1848. In 1854 he established a nursery near Philadelphia and in 1859 founded the *Gardener's Monthly*. Mr. Meehan wrote extensively on botany and horticulture, and in recognition of his standing was elected to the Academy of Natural Sciences and its president in 1879. A few months before his death he was given the Veitch silver medal, the highest award for horticultural work. Mr. Meehan's published books are: *The American Handbook of Ornamental Trees* (1853), *The Native Flowers and Ferns of the United States* (1878-87), and *Wayside Flowers* (1881), besides many magazine articles and the articles on botany in the *Encyclopædia Americana*.

MEERSCHAUM. An interesting account of the occurrence of meerschaum in Turkey has been published in the *Echo of Mines and Metallurgy*. The pits from which the material is taken are 20 to 30 meters (65 to 95 feet) deep and lie in the town of Eski-Schehr. The workmen come chiefly from Persia and Kurdistan, and about 800 to 1,000 men are engaged in the mining. The meerschaum is largely sent to Vienna, to be worked up. France takes the very best grades of the product, Belgium the fifth to tenth grades, and Germany buys even poorer qualities. Sometimes, however, the total output goes to America.

MELDE, FRANZ EMIL, professor of physics in the University of Marburg, Germany, died March 17, 1901. He was born March 11, 1832, at Grussenlueder, near Fulda, Germany, and studied physics and chemistry at the University of Marburg, to which, after a brief experience in more elementary teaching, he returned as assistant in the Mathematical and Physical Institute. His promotion was rapid, and in 1866 he became professor of physics and astronomy. Melde was well known for his researches and works in various departments of acoustics, in which his musical skill and keen ear aided his remarkable manipulative ability. He devised a new and improved method for measuring the frequency of tones of high pitch and performed numerous interesting experiments on vibratory plates, cords, and bells. He was the author of a *Text Book on Acoustics* (1883), and a monograph on *Chladin* (1888).

MENNONITES, a sect which includes a proportionately large rural constituency, organized its first American church near Philadelphia in the late years of the seventeenth century. The denomination includes twelve bodies varying considerably in numerical importance, among which are the Mennonite, Amish, General Conference, Bundes Conference, Brethren in Christ, Reformed, and Defenseless. According to the latest available statistics the denomination has 58,728 members, 1,112 ministers, and 673 churches. This body issues an extensive periodical literature in both English and German; among its issues may be mentioned the *Herald of Truth*, a 16-page semi-monthly published at Elkhart, Ind., and *Zionsbote*—interesting for its location—at Medford, Okla.

MERCURY. The production of mercury in the United States in 1900 was 28,317 flasks (of 76½ pounds net), valued at \$1,302,586, as compared with 30,454 flasks, valued at \$1,452,745 in 1899. The output came chiefly from California. The Telinqua district of Texas, which may become an important producer, yielded 1,800 flasks. While the outlook for Texas mines as far as the quantity of ore is concerned is very promising, at the same time difficulties are encountered on account of the distance from the railway and also on account of scarcity of water. The production in 1901 from the Texas region is said to have been 3,000 flasks. The imports in 1900 amounted to 2,616 pounds, valued at \$1,051, while the exports were 10,172 flasks, valued at \$425,812.

METEORITES. H. A. Ward (*American Journal of Science*, December, 1901) describes the Veramin meteorite which fell in northern Persia in 1880. It is interesting as being one of the four siderolites that have been seen to fall. The other three of the four are those of Barea, Spain, 1842; Lodran, India, 1868; and Estherville, Ia., 1879. Altogether 24 siderolites are known in collections. O. C. Purington contributes two papers on meteorites in the *Journal of Geology*, vol. 9, pp. 51-65, and 174-190. Another paper is by L. Fletcher on the meteoric stones which fell near

Zomba, in British Central Africa, on January 25, 1899 (with notes on the chemical analyses of such bodies), *Mineralogical Magazine*, 1901, vol. xiii, p. 137.

METEOROLOGY. The officials of the United States Weather Bureau express great doubt regarding the efficiency of the prevention of hailstorms by cannonading; but the matter has been and is attracting considerable attention in European countries, notably France and Italy, at the present time, and is often referred to in considerable detail in the United States consular reports. Meteorological stations, which were supported by Harvard College Observatory in Peru, were discontinued at the end of 1901, with the exception of the one at Arequipa. In the report of the chief of the Weather Bureau for 1900 it is pointed out that the forecasting of storms on the North Atlantic coast is now being made possible by the receipt of reports from stations in the West Indies, the Bahamas, Bermuda, France, Great Britain, and Germany. The Jesuit observatory of Manila has lately published meteorological data based on pressure, temperature, and humidity, observations made during the years 1883-98, and rainfall observations from 1865 to 1898. The normal temperatures, relative humidities, and rainfall are given for each month as follows:

	Temperature Fahr.	Rel. Humidity Per cent.	Rainfall Inches.
January	77.0	77.7	1.193
February	77.7	74.1	0.413
March	80.4	71.7	0.736
April	82.9	70.9	1.142
May	83.3	76.9	4.197
June	82.0	81.5	9.622
July	80.8	84.9	14.567
August	80.8	84.4	13.866
September	80.4	85.6	14.925
October	80.4	82.6	7.536
November	79.0	81.6	5.126
December	77.4	80.7	2.134

The Weather Bureau of the Department of Agriculture has issued a *Bulletin* on anemometers, which treats of the instruments for indicating, measuring, and recording wind movements and direction. The following papers and books, which appeared during 1901, may also be mentioned: E. B. Baldwin, *Meteorological Observations of the Second Wellman Expedition* (Report of the chief of the Weather Bureau for 1899-1900, part 7); A. G. McAdie, *The Sea-fogs of San Francisco* (*National Geographic Magazine*, March, 1901); R. Boresteen, *Leitfaden der Wetterkunde*, Brunswick, Germany; J. Hann, *Lehrbuch der Meteorologie*, Leipzig, 1901. The last named is said to be one of the best books on meteorology that has ever been published.

METEORS. See ASTRONOMICAL PROGRESS.

METHODIST CHURCH, CONGREGATIONAL. See CONGREGATIONAL METHODIST CHURCH.

METHODIST CHURCH, FREE. See FREE METHODIST CHURCH.

METHODIST ECUMENICAL CONFERENCE. The third decennial Methodist Ecumenical Conference, worthily succeeding the previous meetings of 1881 and 1891, in London and Washington, respectively, convened September 4, 1901, in London and continued in session until September 18 in the famous City Road Chapel, known as the "Cathedral of Methodism," and built in 1760 by John Wesley. Purely a deliberative body, the conference was confined to discussion relating to almost every phase of Methodist activity, an effort, however, not entirely successful, being made to exclude controversial topics. About five hundred delegates, representing every branch of Methodism, the proportionate basis being one delegate to twenty thousand members, were organized into four general divisions and into two main sections, the eastern embracing English churches and affiliated conferences in Australia, South Africa, and the West Indies, and the western, a larger division, including 277 delegates from Canada and the various sects of American Methodism. In the session of the opening day, presided over by Dr. W. T. Davison, president of the British Wesleyan Conference, and marked by congratulatory speeches and letters of welcome and by the opening sermon of Bishop Charles B. Galloway (Methodist Episcopal Church, South) on *Christian Experience, Its Supreme Value and Crowning Evidence*, Bishop Walters, of Jersey City, brought the "race question" immediately into prominence, and the speech of ex-Mayor Sir Charles T. Skelton, of Sheffield, suggested a theme, the South African War, which later gave rise to impassioned argument. The conference declined to receive the messages of good will from the Archbishop of Canterbury and the Bishop of London, the former con-

cluding with the hope that the Methodist bodies might be reunited with the Established Church, on the ground that they were addressed to the editor of a religious journal rather than the conference; though subsequently to the tentative proposition of unity reply was made that inasmuch as the Anglican Church had not recognized "the validity of the ministry and sacraments of the Methodist Church," any advances on their part would confess an inferiority contrary to their convictions. The following subjects present a general outline of the deliberative work of the Conference: *The Present Position of Methodism; The Influence of Methodism in the Promotion of International Peace; Biblical Criticism and the Christian Faith; Principles of Protestantism versus Sacerdotalism; Methodism and Education; Methodism and Modern Unbelief; Modern Indifferentism; Methodist Literature and Journalism; The Elements of Pulpit Effectiveness; How to Mobilize the Whole Church; The Perversion of Wealth; Practical Methods of Dealing with the Liquor Traffic.* At a well-attended public meeting *The Moral Unity of English-speaking Peoples* was discussed. These various topics elicited profound interest and admirable discussion; but that on *The Influence of Methodism in the Promotion of International Peace* attracted the greatest public attention to the British policy in the South African War, the discussion revealing an unfaltering loyalty to the mother country of the colonial delegates and, on the other hand, a violent opposition on the part of some English and Irish speakers. The death of President McKinley, during the session, was fittingly noticed by expressions of sorrow and sympathy. It was decided by the conference to hold another general assembly in 1911, within the territory of the western section. Though the programme was overcrowded, prohibiting lengthy discussion, and at times failing to give to important topics their proportionate amount of time, the conference was of great value, inestimable because of its entire lack of legislative functions, and because of the fact that its influence only remains to be felt, was proven in the interest not only local, but extending throughout Great Britain and the whole Methodist world. A prevailing note of gratification in the accomplished union of Canadian Methodism and the proximate (January 1, 1902) union in Australia, leading to the resolution of thankfulness and rejoicing in what already had been accomplished and in anticipation of further Methodist consolidation, but illustrates the growing tendency toward unification in Methodist as in other evangelical bodies.

METHODIST EPISCOPAL CHURCH, as a denominational organization of the United States, was founded in Baltimore in 1784, though its inception dates from the year 1766. It has enjoyed a remarkably rapid growth and in 1901 held first rank among Protestant denominations, being second only to the Roman Catholic Church among religious bodies of this country. The church now has 17,879 ministers, 27,574 churches with property (not including parsonages) valued at \$120,616,858, and 2,948,137 members; 32,126 Sunday schools with 349,277 officers and teachers and attended by 2,708,469 scholars. According to an article in the *Christian Advocate* by Stephen V. R. Ford, editor of the *Methodist Year Book*, there is a total of \$173,980,192 invested in the various ecclesiastical buildings, educational and philanthropic institutions, missionary societies, publishing concerns, and other activities of the church gave for all purposes an aggregate of \$18,951,049. The Episcopal College numbers 22, having lost by death during 1901 two members, Bishops William X. Ninde, D.D., LL.D. (q.v.), who died January 3, and Edwin W. Parker, D.D. (q.v.), missionary bishop for Southern Asia, consecrated in 1900, who died June 3. There are now 153 organizations in the "plan of Episcopal visitation;" these include 127 conferences; two, the Eastern Swedish and the Western South America, having been organized this year; 12 mission conferences, a net gain of two during 1901; and 14 missions. The Methodist Episcopal Church maintains foreign missions in: (Protestant lands) Norway, Sweden, Denmark, Finland, Germany, and Switzerland, where there are 397 preachers and 46,717 members in full standing; (Roman Catholic lands) South America, Italy, and Mexico, in which the church has 115 missionaries, 171 native preachers, and 7,266 members with about 5,500 probationers; (Greek Church lands) Bulgaria and Russia, where there are 14 native preachers and 237 members; (non-Christian lands) Africa, China, Japan, Korea, India, and Malaysia, in which there are 536 foreign missionaries, 1,599 ministers, and 52,791 members and 91,804 probationers. The receipts of the general missionary committee for the past year were \$1,233,186. The board of church extension, during 36 years of existence, reports net receipts on general and loan funds of \$7,371,712, out of which 12,018 churches have been aided and 3,750,000 sittings provided. The Twentieth Century Thank Offering, a movement inaugurated in 1898 to acquire \$20,000,000 in excess of usual contributions and for permanent endowment, but not for current support, of various denominational activities, has thus far amounted to \$15,000,000. In connection with the church are (exclusive of duplications) 175 educational institutions with 2,914 professors and teachers, and 46,461 students, and having endowment and property in excess of debt aggregating \$30,703,321. These

institutions include 21 theological seminaries with 962 students, 52 colleges with 29,462 students, 59 classical seminaries, 9 institutions for women exclusively, 49 foreign mission schools, and 4 missionary institutes and Bible training schools.

The committee to revise the hymnal of the church, authorized by the General Conference of 1900, have decided upon about 400 hymns from the old book, and have agreed upon one-half of the 200 new hymns to be selected. Acting upon the recommendation of the general body for a new constitution, the various annual conferences have returned a vote, 8,196 in favor of and 2,513 against the new constitution, which has become effective, the requisite three-fourths approval having been obtained. The principal changes provided are the admission of women delegates in the quadrennial General Conference, and the authority given to laymen's electoral meetings to vote on constitutional questions. The vote necessary in the General Conference to amend the constitution is changed from three-fourths to two-thirds. An event of the year, important as indicating the tendency toward union between the Methodist Episcopal Church and the Methodist Episcopal Church, South, was the action of representatives of the two churches in Oklahoma, where they are to unite in erecting Epworth University at Oklahoma City. The overture, originating in the conference of the northern church, was accepted with few dissentient votes by the southern. With this preliminary step, the question of federation between the two great Methodist bodies came before the meeting of the Episcopal board of the church in Cincinnati and will be discussed more definitely at the next biennial session of the board at Chattanooga in 1903.

METHODIST EPISCOPAL CHURCH, SOUTH. This church, formed in 1845 after a prolonged agitation on the slavery question, still remains an organization distinct from the Methodist Episcopal Church, though fraternity has long been accepted, and indications seem to be pointing toward an even closer bond. According to the latest available statistics, those for 1900, the church has 6,227 ministers and 5,151 local preachers, 14,573 church edifices valued at over \$23,000,000, and 1,470,520 members; and 13,904 Sunday schools with 101,399 teachers and 853,751 scholars. With but one exception the various more important activities of the church received amounts in excess of those of the preceding year; contributions for foreign missions aggregated \$245,224; for home missions, \$155,626; for conference claimants, \$152,742; for church extension, \$71,126. The church has a publishing house at Nashville, Tenn., with assets of nearly a million dollars, and issues 4 denominational publications and 9 Sunday-school periodicals. It maintains in 36 conferences, 147 schools and colleges, with 1,126 teachers and 17,205 students, and with total endowment of \$2,890,515 and property valued at \$5,698,950. The Episcopal board numbers 11 members.

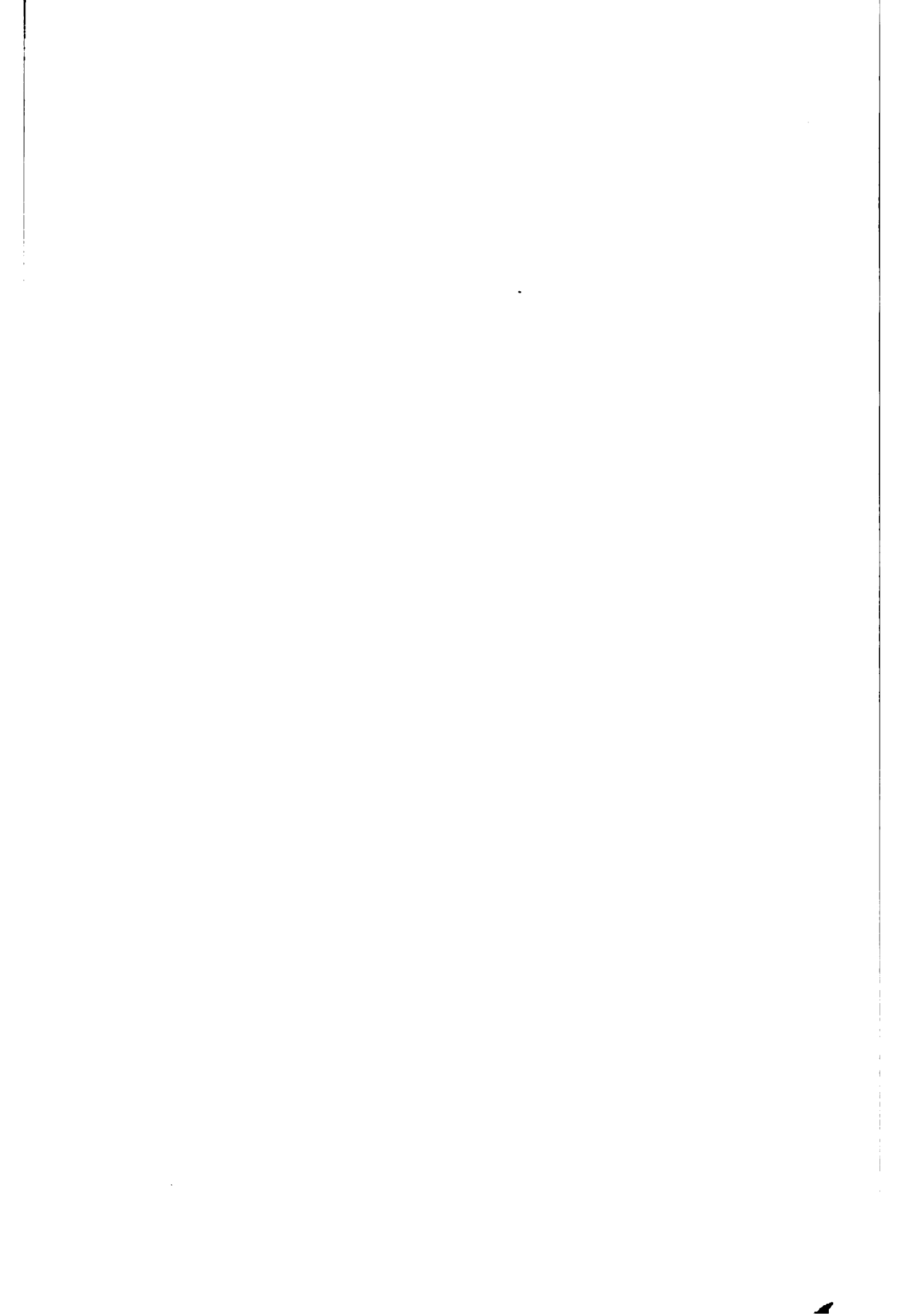
One of the most important events of the year 1901 was a missionary conference held in New Orleans during the latter part of April. This meeting, modeled after the Ecumenical Missionary Conference of 1900, at which it was suggested, attracted a thousand delegates and as many visitors. The prevailing topic, *The Spiritual Basis of Missions*, gave opportunity for broad and interesting discussion. A feature of the conference was the offering for Su-chau (China) University, on which work had been begun, the land and \$18,000 having been given by Chinese. The subscription reached the fifty thousand dollars desired for the completion of permanent buildings.

METHODIST PROTESTANT CHURCH added during 1901 nearly 3,000 communicants to its membership, which now includes 184,097, with 1,647 ministers and 2,401 churches, the total value of church property being placed at \$4,754,721. There are 2,034 Sunday schools with 16,680 officers and teachers and 126,031 scholars. The church maintains foreign missionary work in Japan, organized into 3 central stations and 22 outlying missions with 21 regular missionaries and 32 native helpers. Under the control of the denomination are a university (Kansas City), a theological seminary, three colleges, and as many secondary institutions of learning; while its publishing activities are represented by two general church organs and nine conference and Sunday-school papers, the board of publication having its headquarters at Baltimore, Md.

METHODISTS, PRIMITIVE. See **PRIMITIVE METHODIST CHURCH OF AMERICA.**

METROPOLITAN MUSEUM OF ART, New York City, organized 1870, is situated in Central Park near Fifth avenue, the main entrance being between Eighty-second and Eighty-third streets. The thirty-second annual report (1901) shows that the income for the year was \$150,340.80 and the expenditures \$139,430.18. The number of visitors to the museum during 1901 was 593,946, being an increase over 1900 of 22,446, and over 1899 of 53,946. Permits were issued during the year by the curator of the department of painting to 208 artists and art students, who copied 504 of the paintings exhibited in the galleries. The curator of the department of casts has nearly completed the classification in chronological order of 950 casts purchased some years ago, but which up to 1901 were stored in the basement of the Museum.

METROPOLITAN MUSEUM OF ART.—Fifth Avenue Front.



These casts are now being placed on exhibition in the south gallery. The annual, or paying, members at the close of 1901 numbered 2,104, as against 2,008 at the end of 1900; the loss in old members during the year was 203, and the addition of new members 299, showing a net gain for 1901 of 96 new members. The new east extension building facing on Fifth avenue is completed, so far as the building proper is concerned, and the interior fittings are now constructed, the board of estimate and apportionment having on December 18, 1901, authorized the sale of bonds of the remaining \$100,000 allowed by the State legislature. The gifts received from the friends of the museum during 1901 were numerous and valuable. Among these may be mentioned ten \$1,000 bonds of the Toledo, Peoria, and Western Railway Company, donated by Mr. Charles B. Curtis. Five legacies were left to the museum, four of which have been already received. They are: (1) From the estate of Victor Henry Burgy, who died in France, in 1900, a collection of 175 objects, chiefly of the periods of Henry II., Louis XIII., Louis XV., and Louis XVI., in silver, bronze, etc., representing church candlesticks, snuff-boxes, clocks, reliquaries, paintings, engravings, etc.; (2) from the estate of Miss M. A. Main, ten large plaques (nine porcelain and one glass); (3) from the estate of C. V. Sidell, a portrait of John A. Sidell by J. Vanderlyn; (4) from the estate of Henry Villard, \$5,000. The fifth legacy, that left by the late Jacob S. Rogers, Paterson, N. J., has not been received. The museum has been made the residuary legatee of Mr. Rogers's estate both real and personal, the value of which has been estimated at about \$5,000,000. The executors had not up to the close of the year turned over the property to the museum. The museum scholarship, founded in 1892 by the family of the late eminent painter, Jacob H. Lazarus, and securing to the winner \$1,000 annually for three years, will be open for competition for the third time in October, 1902. Candidates must notify the secretary of the National Academy of Design on or before September 15, of their intention to take part in the competition. The course of lectures in connection with Columbia University, on a modified plan, is still a feature of the programme of the museum. Secretary, L. P. Di Cesnola.

MEXICO, a Spanish-American republic extending from the United States to Central America. The capital is the City of Mexico.

Area, Population, etc.—The area of the 27 states, 2 territories, and federal district comprising Mexico has been estimated at 767,005 square miles. The population in 1895 was 12,491,573, and according to the census of October 28, 1900, 13,570,545. The increase of 7.43 per cent. thus shown is probably due in part to increased accuracy in the enumeration. The inhabitants of the City of Mexico numbered 356,738, as against 329,774 in 1895. Though the western and northern portions of the country are still the most sparsely populated, these districts show the greatest percentage of increase, owing largely to the development of their mineral resources. Over half the inhabitants are found in seven states—Jalisco, Guanajuato, Puebla, Vera Cruz, Oaxaca, Michoacán, and Mexico.

Government.—The chief executive is a president, assisted by a cabinet, while the legislative power devolves upon a congress of two houses, a senate and a house of representatives. The president is General Porfirio Díaz, who was inaugurated on December 1, 1900, for his sixth four-year term. The several states enjoy local self-government. The regular army in 1900 was reported to number 2,068 officers and 30,075 men. The navy is inconsiderable, its personnel being about 90 officers and 500 men.

Finance.—The monetary standard is silver and the unit of value the dollar, which was worth in United States money 49 cents on October 1, 1900, and 46.4 cents on October 1, 1901. The chief sources of revenue are internal taxation and customs, and the largest items of expenditure are for the service of the debt and for the army. The revenue and expenditure in the fiscal year 1899 were 60,139,212 dollars and 53,499,541 dollars respectively; in 1900, 64,261,076 dollars and 57,944,688 dollars. The budget estimates for 1901 were 61,694,000 dollars for revenue and 61,577,990 dollars for expenditure.

In 1900 the foreign debt, in addition to currency bonds for 140,000 dollars, amounted to £22,628,920 (\$110,023,639); the internal debt, including a floating debt of some 954,000 dollars, stood at about 114,542,648 dollars.

Industries and Commerce.—The principal industries are agriculture and mining. Farming methods are in great part primitive and manufacturing is unimportant. In corn production, which in 1898 amounted to 111,347,000 bushels, Mexico ranks third among the countries of the world; the United States and Austria-Hungary are first and second. The wheat crop in 1898 amounted to 8,789,000 bushels. In Yucatan the export of henequen is of increasing importance; the henequen export from the port of Progreso in 1900 was valued at over 20,000,000 dollars. At the end of the fiscal year 1901 there were 11,865 taxed mining properties, of which nearly one-third were in the states of Durango, Chihuahua, and Sonora. In total value silver is the leading metal mined, but copper has become very important; the exportation of the latter

metal in the fiscal year 1901 was valued at over 10,000,000 dollars, which is double the amount of the preceding year. The value of the world's silver production in 1900 is reported at \$112,205,742, of which the United States produced \$35,576,900 and Mexico \$34,269,494. The reported silver coinage in Mexico for the fiscal year 1901 was 18,290,640 dollars, while the silver export was valued at 56,814,552 dollars, the total being valued approximately at \$37,000,000.

The imports stated in Mexican gold dollars (98.3 cents) and the exports stated in Mexican silver dollars have been as follows for fiscal years ending June 30: 1897, 42,204,095 and 111,346,494 respectively; 1900, 61,318,175 and 150,056,360; 1901, 65,083,451 and 148,656,339. The leading imports stated in gold dollars for the fiscal years 1900 and 1901 respectively were: Mineral products, 16,555,522 and 19,031,659; vegetable products, 8,367,184 and 10,185,602; machinery and apparatus, 9,843,880 and 9,531,528; textile products, 9,928,361 and 9,212,374; spirits and beverages, 2,809,986 and 2,788,920. The principal exports stated in silver dollars for the fiscal years 1900 and 1901 respectively were: Mineral products, 84,988,572 and 97,924,498; vegetable products, 50,939,474 and 36,149,110; animal products, 10,633,713 and 11,495,130; manufactured products, 2,813,687 and 2,395,043. The imports, in Mexican gold dollars, from the countries of greatest trade importance were for the fiscal years 1900 and 1901 respectively: The United States, 31,026,415 and 35,165,253; Great Britain, 10,483,200 and 9,924,635; Germany, 6,673,848 and 7,084,742; France, 6,757,138 and 6,504,108; Spain, 2,919,162 and 2,876,743; Belgium, 802,374 and 758,738. The exports, in Mexican silver dollars, by countries for the fiscal years 1900 and 1901 respectively were: The United States, 116,102,285 and 117,226,328; Great Britain, 12,458,047 and 12,033,077; Cuba, 5,882,029 and 5,146,515; Germany, 5,049,487 and 5,018,464; Belgium, 1,926,103 and 4,422,728; France, 6,637,765 and 2,824,303; Spain, 912,173 and 1,187,714. In the foreign trade the shipping entered in the fiscal year 1899 was 1,838,189 tons, and cleared, 1,754,197 tons.

Communications.—Nearly all of the Mexican railways are owned by the government. The total length of the railways has been reported at 14,573 kilometres (9,055 miles) in September, 1900, and 15,454 kilometres (9,603 miles) in September, 1901. At the former date the reported length of telegraph line was 68,250 kilometres (42,408 miles), of which about two-thirds was owned by the federal government. A railway, which it is expected will be completed by the end of 1903, is being constructed by the government across the isthmus of Tehuantepec, from Coatzacoalcas on the Gulf of Campeachy to Salina Cruz on the Pacific. Harbors at both ports will accommodate vessels of the largest size.

HISTORY.

The congress convened on April 1, 1901. At that time the President reported the financial condition of the government to be satisfactory. In the City of Mexico much progress has been made in increasing the water supply, reconstructing the sewerage system, and extending asphalt pavement. Under the just but distinctively autocratic rule of President Díaz, Mexico has made remarkable progress. Besides the new minister to Austria-Hungary (mentioned below), Mexico in 1901 appointed a minister to Argentina. During 1901 troubles occasionally recurred with the Yaqui Indians in Sonora and the Maya Indians in Yucatan. An anti-clerical movement developed considerable force in 1901. This in no way favors Protestantism, but aims to limit the power of the Roman Catholic clergy in secular matters.

In the latter part of 1901 the "free zone" was abolished. This was a strip of territory about twelve and one-half miles wide, extending along the northern boundary of the country from the Gulf to the Pacific, a distance of 1,833 miles, in which only one-tenth of the regular customs duties on goods imported from the United States was charged. Goods sent out of the free zone into Mexico, however, were taxed 90 per cent. of the regular duty. This system was burdensome to persons exporting from the free zone into the regular Mexican customs territory; and, moreover, though the free zone had been established to prevent smuggling, it seems to have encouraged it.

President Díaz has erected to the memory of Emperor Maximilian a *chapelle expiatoire* at Queretaro, for which in the spring of 1901 Emperor Franz Josef sent a picture to be placed above the altar. In June these amenities were followed by the resumption of diplomatic relations between the two governments, which had been interrupted for thirty-three years. Count Gilbert Hohenwart von Gerlachstein was appointed minister to Mexico, and Señor José de Teresa, brother-in-law to President Díaz, minister to Austria-Hungary.

In October, 1901, Mr. W. H. Mealey, a prominent American mine operator in northern Mexico, was imprisoned at Monterey on complaint of claimants to a mine in Coahuila, to which Mr. Mealey maintained he had a clear title. The United States consul-general investigated the case and reported to the State Department at Washington that Mr. Mealey appeared to be the victim of a conspiracy.

Pan-American Conference.—The idea of Pan-Americanism, which practically dates from the enunciation of the Monroe Doctrine, first took practical form in the Conference at Washington in 1890, which was brought about through the efforts of James G. Blaine, then secretary of state. That Congress had little definite result beyond giving the question of Pan-Americanism some permanence among the statesmen of Latin America. A second Conference, designed to promote harmony and closer relations between the several republics, was proposed in 1900, by the United States government, through Mr. John Hay, the secretary of state. In order to dispel any feeling in the minds of the Latin Americans that the United States was endeavoring to exercise undue influence over Latin-American affairs, it was proposed that the Conference be held in some city outside of the United States. The government of Mexico, thereupon, issued invitations to all the other American republics to be represented at a Conference to be held in its capital city in October, 1901. These invitations were accepted, and the Congress, comprising delegates from each of the nineteen American republics, was opened on October 22. The success of the Conference seemed somewhat doubtful in view of the jealousies, disputes, and open quarrels existing among several of the Latin-American countries. An old controversy still existed between Chile and the republics of Peru and Bolivia; relations between Chile and Argentina were becoming disagreeable; the government of Ecuador was distrusted by the government of Colombia; and Venezuela and Colombia, suffering, the one a partially developed and the other a widespread and persistent insurrection, had each accused the other of lending aid to the rebels, and they appeared to be on the point of conflict. At its second meeting, October 23, the Conference adopted resolutions urging these two governments to reach a peaceful settlement of the disputes between them.

At the session of October 30, the following committees were approved, the members being appointed on November 4; the figures stated indicate the number of members in each committee: Arbitration, 19; Pan-American Court of Equity and Claims, 7; Pan-American Railway, 9; Banking and Monetary Exchange, 7; Sanitary Measures, 7; Water Transportation, 7; Commerce and Reciprocity, 9; International Law, 7; Extradition and Protection against Anarchy, 5; Patents, Trade-marks, Weights, and Measures, 3; Practice of the Learned Professions and Literary Relations, 3; Resources and Statistics, 7; Interoceanic Canal, 5; Agriculture and Industries, 5; Reorganization of the Bureau of American Republics, 5; General Welfare, 7; Rules and Credentials, 4; Future International American Conference, 5; Engrossing, 3.

As the Conference was still in session at the close of 1901, its final decisions cannot be stated. Of the questions before the Conference the most important were those assigned for consideration to the first five committees named above. With regard to arbitration, the Mexican delegates brought forward a programme adhering in general to the principles of The Hague Conference of 1899; this programme, however, was less inclusive than the findings of the latter conference, and with regard to compulsory arbitration, left out the retroactive clause. The Argentine delegates, supported by those of Peru and Bolivia, demanded compulsory arbitration on all international questions that were then pending or that should arise in the future, while the Chilean delegates, in view of the position of their government on the question of Tacna and Arica, would not agree to such a proposition. The Chilean representatives were supported by those of Ecuador. It appeared that no satisfactory arrangement for compulsory arbitration would be reached. At the close of the year, it was stated that the Conference had practically agreed upon The Hague convention. With regard to an international court of claims, there seemed to be little prospect of any practical results. On this question, too, the Chilean delegates demanded various provisos that would make such a court of little real service. The spectacular element in the construction of an intercontinental railway appealed strongly to the delegates. The idea of linking the present railways from Argentina and Chile to the United States is picturesque and impressive, and from an engineering point of view the work is doubtless feasible; but the fact that its cost would be some \$200,000,000, at a time when the financial situation in South America is unfavorable, makes any such undertaking, in the immediate future at least, a practical impossibility. It would be many years, moreover, before the receipts of such a road would be likely to cover the working expenses. As to exchange, the delegates realized the desirability of better banking facilities between the South American countries and North and Central America. Hitherto most of the financial transactions have been conducted through European banking-houses. It seemed likely that the discussions on this subject would produce some beneficial results. Quarantine regulations in South America are at present very troublesome to the transportation of both passengers and freight, and it was hoped that some more reasonable system of international sanitation might be obtained.

After the committees were appointed, November 4, the Conference adjourned for

two weeks, in order that the delegates might have an opportunity to study the economic and industrial conditions of Mexico. Various tours were made at the expense of the Mexican government, which, indeed, defrayed all the expenses of the delegates while the Conference was in session. The delegates standing at the head of the several representations were as follows: Argentina, Dr. Antonio Berméjo; Bolivia, Fernando E. Guachalla; Brazil, José H. D. Pereira; Chile, Alberto Blest Gana; Colombia, Carlos Martínez Silva; Costa Rica, Joaquín Bernardo Calvo; Ecuador, Luis Felipe Carbó; Guatemala, Antonio Lazo Arriaga; Haiti, J. N. Léger; Honduras, José Leonard; Mexico, Genaro Rajoso; Nicaragua, Luis F. Corea; Paraguay, Cecilio Báez; Peru, Isaac Alzamora; Salvador, Francisco A. Reyes; Santo Domingo, Luis Felipe Carbó; United States, Henry G. Davis (the other United States delegates were William I. Buchanan, Charles M. Pepper, Volney W. Foster, and John Barrett); Uruguay, Juan Cuestas; Venezuela, José Gil Fortoul.

MEXICO, SYNOD OF (PRESBYTERIAN). See PRESBYTERIAN CHURCH IN THE UNITED STATES OF AMERICA.

MICA. The production of mica in the United States in 1899 and 1900 was as follows:

Material.	1899.		Material.	1900.	
	Pounds.	Value.		Pounds.	Value.
Sheet mica	108,570	\$70,587	Sheet mica	456,283	\$92,758
Scrap mica	3,010,000	50,878	Scrap mica	10,994,000	55,502

The comparatively small increase in the value and large increase in the amount of the material was due to the sale of much small-size sheet mica, which was formerly rejected or ground. The domestic product came from New Hampshire, North Carolina, South Dakota, Virginia, and New Mexico. The imports in 1900 were:

	Pounds.	Value.
Sheet mica.....	1,892,000	\$290,872
Cut and trimmed mica.....	64,391	28,686

In 1900 there was an increased use of mica in the construction of electrical machinery. A plant was also established to use scrap mica for making boiler-tube covering.

MICHIE, PETER SMITH, American educator and brigadier-general U. S. V., died at West Point, N. Y., February 16, 1901. He was born at Beechin, Scotland, March 24, 1839, but was taken by his parents to Cincinnati in 1843. Upon his graduation at the United States Military Academy in 1863, he entered the corps of engineers and served through the remainder of the Civil War in that arm of the service. He was engaged in the operations against Charleston, 1863-64, and had charge of various engineering works during the war, being chief engineer, Army of the James, 1864-65, and of the left column of the Army of the Potomac in pursuit of General Lee, 1865. He received promotions up to lieutenant-colonel for gallant and meritorious services, and was brevetted brigadier-general of volunteers in 1865, for meritorious services during 1864. He was assistant professor of engineering and chemistry at the Military Academy, 1867-71, a member of a military commission in 1870 to investigate European fabrication of steel and iron, and from 1871 until his death, professor of natural and experimental philosophy at the Military Academy. Colonel Michie wrote many scientific text-books, among which are: *Elements of Wave Motion Relating to Sound and Light* (1882); *Elements of Analytical Mechanics* (1887); and *Hydrodynamics* (1887). He also prepared the *Life and Letters of Major-General Emory Upton* (1885).

MICHIGAN, a Lake State of the United States, has an area of 258,915 square miles. The capital is Lansing. Michigan was organized as a Territory June 30, 1805, and admitted as a State January 26, 1837. The population in 1900 was 2,420,982, while in June, 1901, as estimated by the government actuary, it was 2,457,000. The populations of the five largest cities in 1900 were: Detroit, 285,704; Grand Rapids, 87,565; Saginaw, 42,345; Bay City, 27,628; Jackson, 25,180.

Finance.—The receipts of the Treasury for the year ending June 30, 1901, were \$5,825,973.36, and the expenditures \$5,700,007.05. The balance on hand June 30, 1901, was \$2,627,523.84. The State debt was reduced \$83,200 during the year, leaving on June 30, 1901, a balance outstanding of \$416,800, all in war-loan bonds of 1898. The State tax rate for the year was 2.43 mills per dollar, while the total value of State property as returned for taxation was \$1,578,100,000.

Industries.—The census returns for 1900 show that there has been a large growth in the manufacturing and mechanical industries in Michigan during the last half century. Since 1850 the population has increased from 397,654 to 2,420,982, while the average number of industrial wage-earners has increased from 9,344 to 162,355, em-

bracing in 1900 6.7 per cent. of the entire population, as compared with 2.3 per cent. in 1850. In 1900 the capital, exclusive of capital stock, invested in the 16,807 mercantile establishments reporting, was \$284,097,133; at the same time the gross value of the products was \$356,944,082, while the net value, exclusive of materials re-used in the process of manufacture, was \$214,725,626. Michigan is very favorably situated as to manufactures, on account of its facilities for water and rail transportation and the growing markets afforded by the increasing population of the West. On the other hand, it is handicapped by a poor supply of coal, for though there are extensive coal deposits in the central part of the Lower Peninsula, these deposits are of an inferior quality, and manufacturers at times find it difficult to secure a supply adequate to their demands.

The manufacture of lumber and timber products is the most important industry in the State. The products of this industry in 1900 were valued at \$54,290,520, or 15.2 per cent. of the total value of the products of the State. In 1890 the products were valued at \$83,121,969, so that there has been a decrease during the decade of \$28,831,449, or 34.7 per cent. The vast pine and hardwood forests have constituted the State's most valuable natural resource, and the decline in the industry since 1890 is the inevitable penalty the State has been obliged to pay for the extravagance and wasteful exploitation of its forests in the preceding decades. Public opinion is now developing in favor of a system of forestry, and a commission has been created looking toward the protection of the woods. The manufacture of flouring and grist-mill products ranks second among the industries of the State, with products valued in 1900 at \$23,569,991, an increase during the decade of \$815,162, or 3.6 per cent. In earlier decades, owing to inadequate means of transportation, the number of flouring and grist mill establishments was much larger than at present. In recent years the industry has tended to localize at points possessing superior water power or shipping facilities, such as Grand Rapids, Detroit, Adrian, Greenville, Cold Water, and Saginaw. Foundry and machine-shop products in 1900 were valued at \$20,615,864, showing an increase since 1890 of \$7,252,834, or 54.3 per cent.

Although hardwood timber is becoming exhausted in the State so that large quantities are imported, Michigan is conspicuous as a centre for the manufacture of furniture. The products of this industry in 1900 were valued at \$14,614,506, an increase since 1890 of \$3,847,468, or 35.7 per cent. Grand Rapids is one of the great furniture markets of the world, and Detroit, Muskegon, and other cities have also extensive plants. Several special methods of interest are used by Michigan to maintain its lead in furniture making; of these may be mentioned the method of selling furniture by photographs, the invention and use of special furniture cars, and the establishment of large semi-annual fairs at Grand Rapids, to which buyers are attracted from a widely extended area. Planing-mill products in 1900 were valued at \$12,469,532, an increase since 1890 of \$2,461,929, or 24.6 per cent. Manufactures of carriages and wagons were valued in 1900 at \$11,205,602, showing an increase since 1890 of \$5,505,661, or 96.6 per cent. The comparative proximity of the carriage establishments to the hard woods required, as compared at least with vehicle manufacturing centres in the East, an increasing local and neighboring market, and excellent shipping facilities have increased the growth of this industry. Other industries are: The manufacture of steam railroad cars, with products valued in 1900 at \$11,078,281; the manufacture of agricultural implements, with products valued at \$6,339,508; tanning and currying of leather, with products valued at \$6,015,590; manufactures of iron and steel, with products valued at \$5,902,058; manufacture of chemicals, with products valued at \$5,364,724; slaughtering and meat-packing, with products valued at \$5,337,417; manufacture of malt liquors, with products valued at \$5,206,825. In addition to these, special attention may be called to the manufacture of beet sugar. There were nine establishments engaged in this industry in 1900, with 473 wage-earners, and products valued at \$1,602,266. There were no establishments in operation at all in 1890. In 1900 Michigan ranked second in the United States in this industry, the value of its products being 21.9 per cent. of the totals of the United States.

Industrial and Labor Legislation.—The laws of 1895 and 1897 prohibiting the employment of women under 21 years of age for more than 60 hours a week in manufacturing establishments was extended to apply to women working in stores in which more than 10 persons are employed. Another clause of the earlier laws which prohibited the employment of children under 14 in manufacturing establishments was amended to include hotels and stores; and the employment of minors under 16 between 6 P.M. and 7 A.M. in any manufacturing establishment or workshop was interdicted. At the same time the regulations for the inspection of factories, in order to insure their hygienic condition, was extended to apply to stores and hotels, and manufacturers were debarred from conducting their work in tenements except upon a permit showing that the conditions therein were proper for working purposes. An act in accordance with many similar ones passed in different States, designed to hold

various branches of skilled labor to a fixed standard of proficiency, provided that in every city there should be appointed a board of examiners to license plumbers and to formulate rules for the performance of plumbing and drainage work. The board was authorized to appoint inspectors to examine all plumbing done in the city, and those persons who wished thereafter to follow the trade were to be required to pass examinations approved by the board of examiners. An act in the interests of farmers made it unlawful to manufacture or sell imitation butter; provided, however, that oleomargarine might be sold when not colored to imitate butter.

Railway Legislation.—By a constitutional amendment adopted in November, 1900, the legislature was authorized to levy ad valorem instead of specific taxes on railroads. The specific taxes in vogue for many years previous provided for a tax based on earnings, while the ad valorem tax provides for the taxation of that percentage of the total value of railroad property which is collected on all other property in the State paying ad valorem taxes. The bill as finally enacted was a legacy of the Pingree administration, which had sought, at two regular and three special sessions, to have ad valorem taxes paid. By the amendment of the constitution, the legal obstacles to the measure were removed, and although its wisdom was seriously questioned, the law was passed to take effect in 1902, levying ad valorem taxes on railroad companies, union station and depot companies, express companies, car-loaning companies, stock-car companies, and refrigerator and fast freight-car companies. The determination of the actual value of the property was to be made by the State tax commission acting as a board of assessors, which commission was also authorized to determine the average rate of taxation in the State. Upon this average rate of taxation the amount that the railroads will have to pay will of course depend; but it is estimated that they will pay at least twice as much as at present. Another but probably a less fruitful movement against railroads was embodied in a resolution of the legislature petitioning Congress to amend the interstate commerce act of 1887, which was declared to be defective in many ways. The legislature asked that the act of 1887 be so amended as to give the interstate commerce commission power to adjust freight rates in such a manner as to put an end to discriminations in favor of one section against another, or in favor of one class of shippers against another, and to determine what are just and reasonable rates, and to fix such rates, and to be authorized to put its rulings and decisions into full force and effect. The law prohibiting the consolidation of railways was modified with reference to street railways by providing that those companies whose lines formed together one continuous line, and were not naturally competing roads, might unite and consolidate.

Other Legislation.—Other legislation proposed constitutional amendments to provide for increased pay to the members of the legislature and to authorize the legislature to provide for the indeterminate sentence of criminals and for their release on parole. For the moral protection of delinquent minors, it was provided that no person of sixteen years, when placed under arrest, should be confined in a cell with an adult prisoner or conveyed to or from prison in company with adult prisoners, or be permitted to remain in court during the trial of adults; but that such minor should have a separate trial apart from the trial of other criminals. An act obnoxious to all politicians was repealed. This was an act of 1891 directing all candidates for election and all chairmen of State, district, and county political committees to make sworn affidavits, within twenty days after each election, of the amount of money spent by them in the political campaign preceding, and to make oath that the money spent had been used for legal purposes only. An act regarding foreign corporations entering the State provided that all such corporations, before beginning business, must file with the secretary of state a certified copy of their charter or articles of incorporation, must designate an agent in the State upon whom process against the company might be served, and must pay a franchise fee of one-half a mill on each dollar of that proportion of the company's authorized capital stock represented by the property owned and used and the business transacted in the State; and if the business or property of the corporation increased then a commensurate additional fee must be paid. The use of the United States flag was prohibited for advertising purposes. Congress was appealed to under article five of the constitution to call a convention to propose an amendment providing for the direct election of United States senators.

Elections.—A State election was held in April, 1901, for a justice of the supreme court and for two regents of the State University. For justice of the supreme court, Robert M. Montgomery (Rep.), received 219,097 votes, and Allen C. Adsit (Dem.), 124,485 votes, giving to the Republican candidate a plurality of 94,612 votes. For regents of the university, Frank W. Fletcher (Rep.) and Henry W. Carey (Rep.) were elected by slightly smaller pluralities than the Republican justice of the supreme court. Two constitutional amendments submitted at the same time to the electors were rejected. One of these increased the pay of members of the legislature, and the other provided for additional circuit judges. On January 15, 1901, the legislature

of Michigan elected James McMillan (Rep.) to succeed himself as United States Senator for the full term ending March 4, 1907. The vote in the two branches of the legislature was: Senate—McMillan, 31; T. E. Barkworth (Dem.), 1. House of Representatives—McMillan, 85; Barkworth, 10; not voting, 5.

State Officers.—Governor, Aaron T. Bliss, Republican, elected for two years, term ending January, 1903; lieutenant-governor, Orrin W. Robinson; secretary of state, Fred. W. Warner; treasurer, Daniel McCoy; auditor, Perry F. Powers; attorney-general, Horace M. Oren; superintendent of education, Delos Fall; secretary of agriculture, A. E. Wildey; commissioner of insurance, Harry H. Stevens, appointed. Supreme Court: Chief justice in 1901, term two years, Robert M. Montgomery; in 1902, term two years, Frank A. Hooker; associate justices, Joseph B. Moore, Charles D. Long, Claudius B. Grant, and Frank A. Hooker (in 1901) and Robert M. Montgomery (in 1902)—all Republicans.

Congressional Representatives (57th Congress).—In the House—John B. Corliss, from Detroit; Henry C. Smith, from Adrian; Washington Gardner, from Albion; Edward L. Hamilton, from Niles; William A. Smith, from Grand Rapids; Samuel W. Smith, from Pontiac; Edgar Weeks, from Mount Clemens; Joseph W. Fordnay, from Saginaw; Roswell P. Bishop, from Ludington; R. O. Crump, from West Bay; A. B. Darragh, from St. Louis; and Carlos D. Sheldon, from Houghton—all Republicans. In the Senate—Julius C. Burrows (until 1905), from Kalamazoo; and James McMillan (until 1907), from Detroit—both Republicans.

MICHIGAN, UNIVERSITY OF, Ann Arbor, Mich., founded 1837. The calendar for the year 1901 shows an attendance of 3,482, an increase of 179 over the year 1900. This does not include the students of the summer school, of whom there were 228. Every department of the university increased in attendance except the School of Pharmacy. Of the total enrollment, 2,144 students were from Michigan; 126 were registered as graduates; 1,369 were in the department of literature, science, and arts; 359 in engineering; 563 in medicine and surgery; 873 in law; 71 in pharmacy; 71 in the Homœopathic Medical College; 273 in dental surgery; and 418 in the summer school. A certain number are here counted in two places. In the foregoing numbers, 720 women are included. In 1901 the university granted 775 degrees, only 7 of which were honorary. Four received the degree of Ph.D. An important change has been made in the matter of degrees. The baccalaureate degrees of philosophy, letters, and science have been abolished, and the one baccalaureate degree of Bachelor of Arts will be conferred in the future. This places Michigan in line with the leading universities of the country in this particular, and is in accord with the policy of the graduate school, where the degrees of M.Ph. and M.S. were abolished in 1900. At the same time the electives have been increased to such an extent that the student has a large degree of choice in his freshman year and practical freedom afterward. An important addition to the work of the year 1901, was the appointment of an instructor in forestry, and an effort will be made to secure State aid and cooperation. The library was increased by 10,045 volumes in 1901, making a total of 155,524 volumes. The income for the year was \$588,423, of which \$329,132 came from the State. In addition, \$21,745 was received as contributions to or interest on trust funds. On June 30, 1901, the trust funds of the university amounted to \$243,891. With the rapid growth of the university, the need for additional buildings is imperative. All of the eight specific recommendations contained in the annual report of the president relate to the physical needs of the university.

MICROSCOPICAL SOCIETY, AMERICAN. See ZOOLOGICAL SOCIETIES.

MILAN, ex-king of Serbia, died in Vienna, February 11, 1901. He was born August 22, 1854, at Jassy, in Moldavia, and was a member of the Obrenovitch family, then in exile. His great-uncle, Michael, the reigning prince of Serbia (then under the suzerainty of Turkey), adopted him when he was left an orphan and sent him in 1864 to Paris to be educated. He returned in 1868 upon the assassination of Michael and succeeded him as ruling prince, being under the direction of a regency of ministers until 1872, when he assumed full authority. In 1876, yielding to popular clamor, Milan rebelled against Turkish sovereignty, and placing a Russian general, Tchernayef, at the head of the Serbian army, openly declared war. But Tchernayef was defeated and Serbia was saved only by the intervention of Russia. While Russia was defeating Turkey in the war of 1877-78, Milan seized a favorable opportunity and again revolted, this time successfully. Serbia became an independent state in 1878, and Milan was proclaimed king in 1882. His reign was a political storm. Leaning toward Austrian influence which looked to internal improvements in Serbia, the king devoted himself to railway construction, the development of natural resources, and army reorganization on the basis of compulsory enlistment. Taxation was increased to achieve these projects, and the gross managerial incompetency and extravagance displayed by the authorities, in addition to the new and objectionable plan of enforced military service, engendered discontent among the peasants, which,

fostered by an opposition of Russophil tendencies, burst into overt acts of secession (notably in 1883) that required force to subdue. In 1885, envious of Bulgaria, which had acquired Eastern Roumelia as a result of the Philippopolis revolution of that year, Servia went to war with her more powerful neighbor. The army in its disorganized condition was decisively defeated at Slivnitza, and the Bulgarian advance on Belgrade had to be stopped by an Austrian ultimatum. In 1889, without any publicly known cause, Milan gave the people a new constitution, much more liberal than his first one of 1869, and two months later (March), apparently with no more reason, suddenly abdicated in favor of his son Alexander, then twelve years old. He resided for a time in Paris and received a crown award of 1,000,000 francs with the stipulation of continued absence from Servia during his son's minority. But he returned in 1894 to advise Alexander when he was proclaimed king, was restored to the citizenship he had renounced, and allowed to remain, with the privileges of the royal household, and in 1898 was appointed commander-in-chief of the Servian army. The friendly relations between Milan and his son were broken, however, by the marriage of the latter in 1900 to Draga Maschin, which demonstrated Alexander's inclination to Russian influence. As a ruler, Milan marred his zeal for the political and commercial betterment of his subjects by the impulsive shortsightedness of his official acts. As a man, his moral delinquencies became public scandals. In 1875 he married Nathalie Ketchko, of Moldavia, who bore him one child, Alexander. She won the love of the Servians, and it was the divorcing of her in 1888 after conjugal differences arising from his orgies that is considered the cause of his abdication. They were nominally reconciled and the decree of divorce annulled in 1893.

MILBURN, JOHN GEORGE, president of the Pan-American Exposition at Buffalo (May to November, 1901), was born near Sunderland, England, December 13, 1851, and was educated in the private schools of that country. After coming to the United States he studied law at Batavia, N. Y., and was admitted to practice in 1874, establishing himself at Buffalo. He was one of the most active of the promoters of the Pan-American Exposition, and was made its head at the organization of the exposition stock company in 1899. President McKinley, after being shot on September 6, was taken to Mr. Milburn's home and died there on the 14th.

MILITARY ACADEMY, UNITED STATES, at West Point, N. Y., opened 1802. The new regulations by which the examinations for entrance are now placed under the control of the secretary of war has marked a signal change in the history of the academy. New and higher entrance requirements will go into effect in 1902, and the examinations will hereafter be limited to one each year, held on May 1, at a largely increased number of military posts. A considerable reduction of the mental work required of the new cadet, before he has thoroughly adapted himself to the academy's methods, is one of the expected benefits of the new system. In the future, two alternates will be named with each principal nominated by a congressman. It is now proposed that candidates be admitted to the academy on certificate, so far as the mental examination is concerned—(1) when they have gained the appointment by a satisfactory competitive examination; (2) on certificate of graduation from a public high school of the proper standard; (3) on certificate that the candidate is a regular college or university student. The principal benefit urged for this plan is that a candidate may, from the date of his appointment, give his time to preparing for the course he will take up, without using this time in going over subjects in which he has already been declared proficient. The most important material improvement in 1901 was the complete renovation of the library building. In his annual report the superintendent again urged the enlargement of the academy's plant as an imperative necessity. As to the library, the present collection consists of nearly 45,000 volumes and 6,000 to 8,000 pamphlets, imperfectly arranged and in many ways unadapted to the requirements demanded of it. It is proposed to appoint an experienced librarian, to give his whole time to the department, and under his direction to fill all gaps by the acquisition of the books on scientific and military subjects necessary to make the library collection truly representative of military science and history and its related branches.

Early in 1901 the investigation was closed in the case of Oscar L. Booz, a cadet who was dismissed in 1898, and whose death in 1900 was alleged to have been caused by hazing injuries received while at the academy. The examination showed that the death of Booz was not caused by hazing, although hazing abuses did exist at the time. In spite of the searching inquiries of the winter of 1900-01, it was evident that there was still a group of cadets who resented the attitude of the authorities on hazing, and several of them were severely punished for indulging in the practice. In consequence, on April 16, 1901, a large number of cadets engaged in an insubordinate demonstration directed against the superintendent, the participants in which were dismissed, suspended, or subjected to lesser penalties, according to the degree of offense. The superintendent reports that throughout the hazing season of summer encampment the great majority of cadets have obeyed the new order of affairs.

loyally and willingly. Another reform is the abolition of "official hazing"—"the harsh and nagging tones of the cadet officers over new cadets;" and the custom of settling disputes by prearranged and often brutal fist fights. There were on duty at West Point, on September 1, 1901, a total of 82 officers and 464 cadets, a net increase of 6 officers and 35 cadets. P. S. Michie (*q.v.*), for thirty years head of the department of natural philosophy, died February 16, 1901. During the year 1901-02, 29 cadets were discharged for deficiency in studies, 2 for physical disability, 2 were dismissed, 12 resigned, 1 died, and 2 withdrew. Owing to the need for officers arising from the reorganization of the army, the first class was graduated in February, 72 cadets entering the service, besides 2 in June.

MILK. During the summer of 1901 important experiments were made by Dr. D. H. Bergey, of Philadelphia, to determine the prevalence of streptococci in cows' milk. Of 40 samples of milk purchased in the open market, 90 per cent. were found to contain micrococci, and 50 per cent. contained streptococci (the bacteria of supuration). He found 12.5 per cent. of 16 samples from a well-conducted dairy contained micrococci, but only 6.25 per cent. contained streptococci. Of 28 samples collected from one of the best dairies, only 17.8 per cent. contained micrococci, and none contained streptococci. From another excellent dairy 7 samples were obtained, of which 85.71 per cent. contained micrococci and 28.57 per cent. contained streptococci. From yet another, 8 samples were taken, of which 62.5 per cent. contained micrococci, and none contained streptococci. Bergey emphasizes the fact that care which prevents the entrance of dirt into milk also tends to exclude streptococci. The Medical Society of the County of New York appointed a milk commission from among its members, charged with the investigation of the milk supply of the city. The report of the commission was made in October, 1901. The members of the commission made 30 visits to farms and dairies, some of which were located 180 miles from New York City, each visit consuming one day or more. The commissioners conclude that an expensive or elaborate creamery is not necessary for the production of clean milk; that the contamination of milk is most marked during the first 45 minutes after it is drawn from the udder; that the nipples, udder, and adjoining parts of the abdomen of the cow should be thoroughly clean before each milking; that the hands and clothing of the milker should be as sterile as possible; that pails, strainers, pans, and cans should be absolutely clean; that dust should not be allowed to collect on walls or ceilings of cow-houses, or insects in cracks, while whitewash should be carefully used; that milk as soon as drawn from the cow should be immersed in water that has been cooled with ice to 40° F., in order to destroy germs that may have gained entrance in spite of care. The commissioners report an instructive case. Cows were milked in a barn, the ceilings of which were covered with dust; the hay in a loft overhead was full of dust; the windows were dirty; and the hot rays of the sun entered the stable. The manure-gutter behind the animals was filthy. Clothing and farming utensils were kept in the stable. The cows were overfed, and were rendered nervous and restless by swarms of flies. Water in the aerator stood at 60° F. The milk obtained under such conditions, on being tested, revealed the presence of 455,000 bacteria to the cubic centimetre. The stable was then cleaned. The manure-gutter was flushed and disinfected, the clothing and tools were removed, the ceilings were freed from dust and whitewashed, the floors were washed, the windows were cleaned and shaded with green material, the cows were put on short rations. The milk drawn under these new conditions, and strained in the dairy in place of the barn, yielded only 3,600 bacteria to the cubic centimetre. The commissioners recommend cleanliness and rapid cooling of the milk for the reasons stated, and also thorough icing of the milk from the time it leaves the dairy till it reaches the consumer, to prevent the formation of toxins. Infant mortality from enteritis could be lessened in all large cities, if the production of toxins in milk were arrested in transit. See DAIRYING.

MILNER, First Baron, Sir ALFRED MILNER, was made first governor of the Transvaal and Orange River colonies in 1901. He was born in Germany in 1854, and was educated in that country and at King's College, London, and Balliol College, Oxford. He was called to the bar in 1881. Until 1885 he devoted himself to journalism, chiefly as a writer on the *Pall Mall Gazette*, and two years afterwards was made private secretary to Mr. Goschen, chancellor of the exchequer, a position which he held until 1889. Three years as under-secretary for finance in Egypt (1889-92) gave him the opportunity to gather material for his authoritative book, *England in Egypt* (1892). In 1892-97 he was chairman of the board of inland revenue. In 1897 he became governor of Cape Colony and high commissioner of South Africa. Lord Milner took an active part in the negotiations preceding the outbreak of the South African War, and he has steadfastly advocated its vigorous prosecution. Early in 1901 he left Cape Town for London, where he was received with honor, created baron, and given the freedom of the city.

MINERALOGY. During 1901 a number of new species were described, among which may be mentioned the following: *Badenite*, an arsenide of copper, nickel, and iron; *brostenite*, a hydrated manganate of iron and manganese; *ceruleite*, an arsenate of aluminum and copper; *hussakite*, a mineral differing from xenotime in having 6 per cent. of sulphuric acid; *molybdophyllite*, a lead silicate; *seligmannite*, a lead sulpho-arsenite; *sulvanite*, a sulpho-vanadate of copper; *synchisite*, a carbonate of cerium, fluorine, and lime; *termierite*, and *lassallite*, both silicates of aluminum; *torrensie* and *viellaurite*, described as carbonates and silicates of manganese, but which are probably not good species; *violaite*, a strongly pleochroic pyroxene. Part 6 of the first volume of C. Hintz's *Handbuch der Mineralogie* has been issued, as has also a twelfth edition of F. Rutley's *Mineralogy*.

MINERAL PAINTS. The term mineral paints includes such mineral substances as are produced primarily as pigments. These substances embrace red and brown hematites, from which metallic paint is made; clay and earth containing iron used in making ochre, umber, sienna, etc.; barytes, or heavy spar, and the other substances listed below. The production of ochre in the United States in 1900 amounted to 17,015 short tons, valued at \$186,707, as compared with 14,124 short tons, valued at \$140,168 in 1899. This came from eleven States, of which Pennsylvania, Georgia, and Vermont were the most important, the first mentioned supplying 43 per cent. The production of umber in 1900 amounted to 1,452 short tons, valued at \$26,927, and came from Illinois and Pennsylvania. The production of sienna was 957 short tons, valued at \$14,771, and was produced by Illinois, Pennsylvania, and New York. The imports in 1900 were valued as follows: Ochre, \$58,361; umber, \$11,862; sienna, \$15,407. The production of mineral paints in 1900 in the United States, as stated by the Geological Survey, was as follows:

Material.	Short Tons.	Value.	Material.	Short Tons.	Value.
Ochre	17,015	\$186,707	Venetian Red ...	14,096	236,574
Umbre	1,452	26,927	Zinc White	48,840	\$3,667,210
Sienna	957	14,771	Soapstone	100	700
Metallic Paint ..	23,218	261,831	Slate	6,395	53,942
Mortar Color ...	6,689	79,911	Others	1,700	20,000
Total.....			121,062 \$4,548,573		

MINERAL PRODUCTION OF THE UNITED STATES. The importance and steady progress of mining and metallurgical works in the United States is illustrated in the annual statistical reports of mineral products published by the Division of Mining and Mineral Resources of the United States Geological Survey. An abstract of these statistics covering the years 1899 and 1900, in tabular form, will be found on the opposite page; this table is supplemented by the separate articles on metals and other mineral products in this volume. It will be noticed in nearly every case that in the year 1900 the total amounts produced and the values of the products show a marked increase over the year 1899. See ABRASIVES; ALUMINUM; BORAX; CLAY; COAL; COPPER; FLUORSPAR; FULLER'S EARTH; GOLD; GYPSUM; IRON AND STEEL; LEAD; MERCURY; MINERAL PAINTS; NATURAL GAS; NICKEL; PETROLEUM; PHOSPHATE; PLATINUM; PYRITE; SILVER; TIN; ZINC.

FOOTNOTE TO TABLE ON OPPOSITE PAGE.

- a. By "spot" value is meant value at the point of production.
- b. Long tons are tons of 2,240 avoirdupois pounds; short tons are tons of 2,000 avoirdupois pounds.
- c. Iron ore 1892: 16,296,666 long tons; value at mines: \$38,204,896. 1893: 11,587,639 long tons; value at mines: \$19,265,973. 1894: 11,879,679 long tons; value at mines: \$13,577,325. 1895: 15,967,614 long tons; value at mines: \$18,219,684. 1896: 16,005,449 long tons; value at mines: \$22,788,009. 1897: 17,518,046 long tons; value at mines: \$18,953,221. 1898: 19,493,716 long tons; value at mines: \$22,060,887. 1899: 24,683,173 long tons; value at mines: \$34,999,077. 1900: 27,553,161 long tons; value at mines: \$66,590,504.
- d. Figures of production furnished by the Bureau of the Mint, Treasury Department. Coining value, \$1,2929 per troy ounce. Commercial value 1895: \$36,445,000. 1896: \$39,655,000. 1897: \$32,316,000. 1898: \$32,118,420. 1899: \$32,853,700. 1900: \$35,741,140.
- e. Figures of production furnished by the Bureau of the Mint, Treasury Department. Coining value, \$20.6718 per troy ounce.
- f. Including copper made from imported pyrites.
- g. The product from domestic ores only.
- h. Of 76½ avoirdupois pounds net.
- i. Including aluminum alloys.
- j. Includes antimony smelted from imported ores, in 1899, 83 per cent.
- k. Including nickel in copper-nickel alloy, and in exported ore and matte.
- l. Including brown coal and lignite, and anthracite mined elsewhere than in Pennsylvania.
- m. Of 42 gallons.
- n. Estimated from census returns. Value of clay products in 1894: \$64,575,385; 1895: \$65,409,806; 1896: \$63,110,408; 1897: \$62,359,991; 1898: \$73,892,884. 1899: Census returns: \$66,797,370; 1900: \$66,212,345.
- o. Of 300 pounds for natural cement, and 400 pounds for artificial Portland.
- p. Of 280 pounds net. The reduced price in 1893 is due to omitting cost of packages.
- q. Including metallic paints, ochre, umber, venetian red, sienna, ground soapstone, ground slate, and mineral black.
- r. Including building sand, glass sand, iron ore used as flux in lead smelting, tin ore, nitrate of soda, carbonate of soda, sulphate of soda, and alum clays used by paper manufacturers.

Products.	1899.		1900.	
	Quantity.	Value.	Quantity.	Value.
<i>Metallic.</i>				
Pig iron (spot value a).....long tons (b)	(c)13,620,703	\$ 654	(c)13,789,242	\$259,944,000
Silver, coinage value (d).....troy ounces..	54,764,500	(d) 828	57,647,000	(d)74,533,426
Gold, coinage value (e).....do	3,437,210	400	3,929,897	79,171,000
Copper, value at New York City (f).....pounds....	588,666,921	712	606,117,166	98,494,039
Lead, value at New York City.....short tons (g)	210,500	000	270,824	28,561,638
Zinc, value at New York City.....do	129,051	065	123,886	10,654,196
Quicksilver, value at San Francisco flasks (h)....	30,454	745	28,317	1,302,566
Aluminum, value at Pittsburgh.....pounds....	(i)5,200,000	000	6,000,000	1,920,000
Antimony, value at San Francisco short tons....	(j)1,275	876	(j)1,750	346,980
Nickel (k), value at Philadelphia.....pounds.....	22,541	566	9,716	8,886
Tin.....do	(None)	.....	(None)	.....
Platinum, value (crude) at San Francisco.....troy ounces..	300	1,800	400	2,600
Total value of metallic products.....	.....	\$525,472,243	.....	\$549,934,370
<i>Nonmetallic, spot values a).</i>				
Fuels:				
Bituminous coal (l).....short tons....	193,321,987	\$167,935,304	212,513,913	\$221,183,513
Pennsylvania anthracite.....long tons....	53,944,547	88,142,180	51,221,353	85,757,851
Natural gas.....	.....	20,074,873	.....	23,606,463
Petroleum.....barrels (m).....	57,070,850	64,603,904	63,822,704	75,752,691
Structural Materials:				
Brick clay.....	.....	(n)11,250,000	.....	12,000,000
Cement.....barrels (o).....	15,520,445	12,669,142	17,231,160	13,263,581
Stone (q).....	.....	44,090,670	.....	48,008,789
Abrasive Materials:				
Corundum and Emery.....short tons....	4,900	150,600	4,306	102,715
Garnet for abrasive purposes.....do	2,765	96,325	3,186	123,475
Grindstones.....	.....	675,586	.....	710,026
Infusorial earth and Tripoli.....short tons....	4,334	37,032	3,615	24,207
Millettone.....	.....	28,115	.....	23,856
Oilstones, etc.....pounds.....	.....	306,283	.....	174,087
Chemical Materials:				
Borax.....pounds.....	40,714,000	1,139,882	Refined, tons, 1,002	170,000
Bromine.....do	433,004	108,251	Crude, tons, 24,235	848,215
Fluorspar.....short tons....	15,800	96,650	821,444	140,790
Gypsum.....do	436,236	1,287,080	18,450	94,500
Marble.....do	60,000	30,000	894,482	1,627,203
Phosphate rock.....long tons....	1,515,702	5,064,076	60,000	80,000
Pyrite.....do	174,734	543,249	1,491,216	5,350,248
Salt.....barrels (p).....	19,708,614	5,867,467	204,615	749,991
Sulphur.....short tons....	4,830	107,500	20,869,342	6,944,603
Pigments:				
Barytes (crude).....short tons....	41,894	139,528	3,525	88,100
Cobalt oxide.....pounds.....	10,230	18,512	67,680	198,089
Mineral paints.....short tons (q).....	63,111	728,389	6,471	11,548
Zinc white.....do	40,148	2,211,060	72,222	881,363
Miscellaneous:				
Asbestos.....short tons....	681	11,740	48,840	3,667,210
Asphaltum.....do	75,065	553,904	.....	.....
Bauxite.....long tons....	35,280	125,596	1,054	16,310
Chromic iron ore.....do	(None)	(None)	54,389	415,958
Clay (all other than brick).....do	.....	1,645,328	23,184	89,676
Feldspar.....short tons....	27,202	238,545	140	1,400
Fibrous talc.....do	54,555	438,150	.....	.....
Flint.....do	36,652	229,345	21,853	173,659
Fuller's earth.....do	12,381	79,644	63,500	490,500
Graphite.....pounds.....	Crystal's, lbs. 2,800,782	167,105	32,495	179,351
.....	Amorp., tons 2,324	.....	9,699	67,585
Limestone for iron flux.....long tons....	6,707,435	4,695,205	5,507,855	197,579
Magnetite.....short tons....	1,280	18,490	611	4,500,000
Manganese ore.....long tons....	9,335	62,278	2,252	19,333
Mica.....pounds.....	Sheet, lbs. 108,570	70,567	11,771	100,289
.....	Scrap, tons 1,505	30,878	Sheet, lbs. 456,283	92,758
Mineral waters.....gallons sold	39,562,136	6,948,030	Scrap, tons 5,453	54,302
Monazite.....pounds.....	350,000	20,000	47,558,784	6,245,172
Precious stones.....	.....	185,770	906,000	48,805
Pumice stone.....short tons....	400	10,000	(None)	233,170
Rutile.....pounds.....	230	1,030	(None)	(None)
Soapstone.....short tons....	24,765	330,605	300	1,300
Total value of nonmetallic mineral products.....	.....	\$445,428,651	.....	\$516,671,217
Total value of metallic products.....	.....	525,472,243	.....	549,934,370
Estimated value of mineral products unspecified (r).....	.....	1,000,000	.....	1,000,000
Grand total.....	.....	\$971,900,894	.....	\$1,067,006,587

MINERAL WATERS. The production of mineral waters in the United States in 1900 came from 561 springs, and amounted to 47,558,784 gallons, valued at \$6,245,172. This is a gain of 7,996,648 gallons over 1899, but a loss of \$702,858 in value. The average price per gallon was 12.5 cents. The imports amounted to 2,485,042 gallons, valued at \$678,874.

MINNESOTA, a northwestern State of the United States, has an area of 83,365 square miles. The capital is St. Paul. Minnesota was organized as a Territory March 3, 1849, and admitted as a State May 11, 1858. The population in 1900 was 1,751,394, while in June, 1901, as estimated by the government actuary, it was 1,799,000. The populations of the three largest cities in 1900 were: Minneapolis, 202,718; St. Paul, 163,065; Duluth, 52,969.

Finance.—The receipts of the treasury for the year ending July 31, 1901, were \$8,901,184.54, and the expenditures \$6,900,841.30. At the same time the State debt was \$2,009,000, and the payments made upon it during the year amounted to \$285,000. Among assets of the State were the school fund amounting to \$7,599,218.32, and the university fund amounting to \$931,500.

Industries.—The returns of the decennial census of 1900 show that there has been a steady though not extraordinary growth in the manufacturing industries of the State during the last half century. Since 1850, the population has increased from 6,077 to 1,741,986, while the average number of industrial wage-earners has increased from 63 to 77,234, embracing in 1900 4.4 per cent. of the entire population. In 1900 there was invested in the 11,114 manufacturing establishments reporting a capital of \$165,832,246, exclusive of capital stock; the gross value of the products was returned at \$262,655,881, while the net value of the products, exclusive of materials re-used in the process of manufacture, was \$190,314,135. The development of Minnesota manufactures has been due to its great white and Norway pine forests, to its extensive wheat districts, and to its favorable position for the transportation of products. The most important industry of the State is that of flour and grist milling, the products of which in 1900 were valued at \$83,877,709, or 31.9 per cent. of the total value of the products of the State. Minnesota leads all States in this industry, its mills in 1900 turning out 15 per cent. of the total value of flour and grist-mill products in the United States. New York, which is second to Minnesota in this industry, has grist-mill products aggregating but little more than one-half of those of Minnesota. The rapid development of this industry in Minnesota has been due largely to the introduction by Mr. N. La Croix, a French millwright, of a process whereby the hard outer covering of the spring wheat raised in Minnesota might be separated from the kernel. Spring wheat contains more gluten and is more nourishing than winter wheat; and as soon as the new process, by which bran, middlings, and the finest grade of flour were all made from spring wheat, was developed in Minneapolis, the spring wheat became much more valuable than the winter wheat of other States, and Minnesota farmers and manufacturers benefited accordingly. Minneapolis, the leading manufacturing city of the State, is the centre of the flour-milling industry; the Falls of St. Anthony on the Mississippi are utilized for water power, and the products are shipped to Duluth and Superior on Lake Superior. The second industry in importance is lumbering, and third is that of the manufacture of cheese, butter, and condensed milk, the products of 1900 being valued at \$8,479,896, an increase of \$5,521,420, or 186.6 per cent. since 1890. Slaughtering and meat-packing in 1900 had products valued at \$7,810,755, an increase during the decade of \$5,300,124, or 211.1 per cent. The development of this industry is due in large part to the favorable transporting facilities of St. Paul and Minneapolis with reference to receiving cattle from the far ranges of the West and shipping the manufactured products to eastern and southern sections of the country. Other important industries are car construction and steam railroad work, with products valued in 1900 at \$6,319,876; foundry and machine-shop work, with products valued at \$5,975,077; the printing of newspapers and periodicals, with products valued at \$5,790,148; and the manufacture of malt liquors, with products valued at \$4,456,928.

Forest Products.—Minnesota is one of the leading lumber-producing States of the nation, its quantity of merchantable forest pine being probably greater than that of any other State. In 1900 the quantity of lumber sawed in the State, not including laths, shingles, etc., was 1,308,902,000 feet, of this amount \$616,000,000 feet were sawed in Minneapolis. The timber products in 1900 were valued at \$43,585,161, an increase since 1890 of \$18,510,029, or 73.8 per cent. The rapid increase in this industry is in a large part due to the fact that the timber country contains innumerable small lakes and streams, many of which are connected with the St. Louis and Cloquet rivers, or with Lake Superior. The favorable position of Minnesota, both by rail and by the Great Lakes, for the ready transportation of raw material and of manufactured products, has also acted as a stimulus to the lumbering industry.

State Institutions.—Several laws were passed by the legislature of considerable importance to the public institutions of the State. Perhaps the most noteworthy of

was an act centralizing the government of State institutions by abolishing the separate boards formerly in charge of them and submitting for the several boards a Central Board of Control of State Institutions, consisting of three members, who should have financial control of all charitable, correctional, and educational institutions and administrative control as well, except over the university, the normal schools, the schools for the deaf and blind, and the soldiers' home. This law, urged by the governor and recommended by a commission appointed by him to investigate the work of a similar statute in Iowa, went into effect on August 1, 1901, and gave the board and its appointees full administrative control of the State prison, reformatory, hospitals, asylums, and training-school. By another act, the law permitting convicts other than life prisoners to be paroled after having served at least one-half their time was extended to apply to life prisoners, who had served 35 years, minus the usual commutation made for good behavior. An act intended to increase the efficiency of the State school for the blind, and to carry forward the results of its work provided that any resident of Minnesota who had graduated from this school should be entitled to free tuition in the University of Minnesota. The advisability of establishing a State sanitarium for consumptives having been brought to public attention, the legislature appointed a commission to investigate the question and to report to the legislature meeting in 1903.

Marriage and Divorce.—Acts passed by the legislature regarding marriage and divorce, while appearing to operate against individual freedom of action, were intended, as was stated, mainly to prevent children from becoming charges on the State; the vital statistics showing that many orphans in the charitable institutions were either the offspring of parents, one or both of whom were tainted with imbecility or insanity, or else the offspring of parents, one or both of whom had previously been divorced. One law passed on this subject provided that persons should not marry in Minnesota within six months after having been divorced, and the act further prohibited the publication of advertisements by attorneys offering to secure divorces or soliciting business to that end. By another law any woman under the age of 45, and any man of any age unless he should marry a woman over 45, was prohibited from marrying if he or she were epileptic, feeble-minded, or insane. Another enactment provided that no married woman should be liable for her husband's debts, and that a husband should not be liable for any debts of his wife except for necessities; provided, however, that husband and wife should be jointly liable when living together for all necessary household articles and supplies.

Industrial and Labor Legislation.—In endeavoring to stimulate the beet-sugar industry, the legislature had in 1895 offered a bounty on one cent per pound on beet sugar manufactured in the State. Bounties under this law were paid through 1898, and were then discontinued under the opinion of the attorney-general, who declared the law to be unconstitutional. A bill in the further interests of the beet industry and authorizing the State auditor to pay all back claims under the law of 1895 was defeated, apparently showing that the legislature considered the beet industry to be now well established, and not in need of further State aid. In the interests of the farmers a resolution was passed urging Minnesota's congressional representatives to vote for the passage of the Grout Oleomargarine Bill in Congress, and an act was also passed prohibiting the sale in Minnesota of oleomargarine or any oleaginous substance when colored to imitate genuine butter. In the interests of the farmers also \$75,000 were appropriated to provide seed grain for those whose crops had been destroyed in whole or in part by the weather of 1900. The loans, it was stipulated, should be repaid with 4 per cent. interest and should constitute until paid a first lien on the lands and crops. To aid the unemployed, an act was passed authorizing all cities in the State having over 50,000 inhabitants to establish employment bureaus under municipal management. This law was quite similar to one enacted in Connecticut (*q.v.*) during the year, except that the Minnesota law did not specify that the employment bureaus were to be free and did not provide regulations for their efficient management. The number of hours which laborers employed on any State or other public works should be required to work was limited to eight hours daily, and provision was made that all contracts to which the State was a party should contain a stipulation to the effect that the contractor would observe this requirement.

Trusts.—With an abundance of rhetorical ability, the legislature endeavored, without annulling the stringency of any existing trust laws, to define beyond peradventure of dispute "trust pools and conspiracies," and to declare them one and all illegal. A trust or pool under this law was asserted to be constituted by any agreement or endeavor to regulate the price of a product, or to limit its quantity or output; or to limit competition by refusing to sell to or buy of any persons not privy to the pool; or to boycott or threaten any person not in the combination from buying or selling goods. Any person injured by a pool or conspiracy might recover threefold the damages he had sustained besides the cost and a "reasonable" attorney's

threefold the damages he had sustained besides the cost and a "reasonable" attorney's fee. But labor organizations were specifically excluded from the provisions of this act.

Primary Election Law.—The primary election law of 1899 was extended in 1901 from Hennepin County (Minneapolis), so as to apply to the whole State. State officers, however, are to be excluded from nomination at primary elections, and are to be nominated in convention as before, leaving only city and county officials to be nominated by primaries. The law of 1899 provided that any person might run for nomination who presented a petition signed by 5 per cent. of the vote cast in the preceding election for his party's candidate for the same position. The law of 1901 provides that any one may run for nomination for any office on payment of a maximum fee of \$20. The law of 1901 makes a further departure from that of 1899 by prescribing that the voter at a primary election must declare under oath the party with which he is affiliated and whose candidates he supported at the last general election, and with which party he proposes to affiliate at the next election. This provision is regarded as tending to destroy the secrecy of the ballot protecting the freedom and independence of the voter. Its purpose, however, was said to be to prevent a conspiracy of the voters of one party to nominate a weak candidate on the ticket of the other. Of the new law probably the most significant part is that which withdraws State officers from primary elections, thus leaving full scope to the politicians in nominating all the more important officers. Another law intended to prevent fusion of parties prescribes that no party shall be entitled to use or have printed on its official ballot, as a designation, any part of the name of a previously existing party. And in no case shall the candidate of one political party be entitled to be designated as a candidate upon the official ballot of any other political party.

Other Legislation.—An interesting law for the promotion of morality among the young provides that no person under twenty-one years of age may play pool or billiards in any saloon or room adjacent thereto, "or in any restaurant or public place of amusement within this State in which tobacco in any form, confectionery of any kind, or drinks of any kind except water are sold, given away, or in any manner disposed of." For the completion of the new capitol building in St. Paul, a million dollars was appropriated in addition to the two million-dollar appropriations already made. The additional million appropriated was stated to be largely in the nature of a vote of confidence in those who had the building in charge; they being stated to have enjoyed "the distinction of erecting a public building without wasting or diverting a dollar of the appropriation." Another law of importance established the Torrens system of land transfer and registration in the three largest counties in the State; that is, in the counties in which St. Paul, Minneapolis, and Duluth respectively are situated. The Minnesota system follows closely the Illinois model, and will, it is asserted, if found valid in law, be extended to the entire State. An inheritance tax law was passed designed to avoid the unconstitutional features of the old law by stipulating that the tax laid should apply to both real and personal property. The rate of the tax was to be 5 per cent. on collateral and 1 per cent. on direct inheritances, with an exemption, however, of property valued at less than \$5,000. At the same time a commission was appointed, directed to devise a complete system for the just and equitable taxation of all forms of property in the State, and to embody their recommendations in the form of bills to be submitted to the governor on or before the first of February, 1902. An act was also passed to submit to the voters at the general election of 1902 the proposition to increase after that year the general tax on railroad property from 3 to 4 per cent. of the gross earnings; this tax to be in lieu of all other taxes on the property and franchise of the road, and to be estimated on the basis of the gross earnings of the road from business conducted within the State. The legislature adjourned before the middle of April, the Republican caucus having chosen that early date for adjournment in expectation that an extra session would be called in February, 1902, to consider the report of the tax commission. The legislative session, taken as a whole, was said to have been one of the most satisfactory, from the standpoint of the people, in the history of the State; two United States senators were elected without friction or scandal, and the tax rate established for the year was the lowest ever made, in spite of the fact that public institutions were dealt with most liberally.

Memorials to Congress.—By resolutions of the legislature, Congress was petitioned to propose two amendments to the Constitution of the United States. The first of these was that the election of United States senators should be made by popular vote, and the second was that additional powers should be conferred on Congress to define, regulate, prohibit, or dissolve trusts; provided, however, that the rights at present reserved to the States in this matter should not be taken from them.

Red River Valley of the North.—In accordance with the findings of a tri-State drainage association, consisting of delegates from North Dakota, South Dakota, and Minnesota, and reporting to the legislatures of their respective States in January, 1901, the Minnesota legislature passed a resolution petitioning Congress to

appropriate approximately a million dollars for the institution of a drainage system in the valley of the Red River of the North and its tributaries. The resolution stated that the Red River Valley supports nearly a million people, while the value of the property approximated a billion dollars. Some twenty million acres of land in this area were subjected under existing conditions to an unusual overflow entailing losses of about \$500,000. By the erection of locks, dams, and reservoirs this overflow, it was asserted, would be prevented, some 700 miles of waterways would be opened up to navigation, and the region of the valley would be made capable of sustaining five million people.

Northern Securities Case.—When the announcement was made in New York in November, 1901, that the Northern Pacific and Great Northern railroads intended to pool their interests through the medium of a new holding corporation to be called the Northern Securities Company (see FINANCIAL REVIEW and TRUSTS), Governor Van Sant immediately announced that he would oppose the pool as being contrary both to the federal anti-trust act of 1890 and to the Minnesota anti-trust laws. To that end permission was asked by the attorney-general of Minnesota to file a suit in the Supreme Court of the United States, and at the same time Governor Van Sant communicated with the governors of Montana, Idaho, North Dakota, South Dakota, and Washington, asking them to cooperate with him in defeating the proposed merger. At a meeting of the governors or representatives of these States held at Helena, Mont., on December 31, 1901, resolutions were adopted stating that the proposed consolidation was contrary to sound public policy and in violation of the constitutions and laws of the several States represented, with the exception of Idaho, and that the governors and representatives of the States assembled pledged themselves to institute legal action to prevent the merger in all proper ways.

Elections.—The legislature of Minnesota on January 22, 1901, elected two United States Senators, as follows: Knute Nelson (Rep.) was elected to succeed himself for the full term ending March 4, 1907, and Moses E. Clapp (Rep.) was elected to serve out the unexpired portion of the term ending March 4, 1905. This latter vacancy was caused by the death of Cushman K. Davis (Rep.) on November 27, 1900, but was filled temporarily by Charles A. Towne (Silver Rep.). Mr. Towne was nominated by Governor John Lind, with whom he was in political sympathy.

State Officers.—Governor, Samuel R. Van Sant (Rep.), elected for two years, term expiring January, 1903; lieutenant-governor, Lyndon A. Smith; secretary of state, Peter E. Hanson; treasurer, Julius H. Block; auditor, Robert C. Dunn, term four years; attorney-general, W. R. Douglas; commissioner of insurance, E. H. Dearth. Supreme Court—Chief justice, Charles M. Start; associate justices, Calvin L. Brown, John A. Lovely, Charles L. Lewis, and L. W. Collins—all Republicans.

Congressional Representatives (57th Congress).—In the House—James A. Tawney, from Winona; James T. McCleary, from Mankato; Joel P. Heatwole, from Northfield; Frederick C. Stevens, from St. Paul; Loren Fletcher, from Minneapolis; Page Morris, from Duluth; and Frank M. Eddy, from Glenwood—all Republicans. In the Senate—Moses E. Clapp (until 1905), from St. Paul; and Knute Nelson (until 1907), from Alexandria—both Republicans.

MINNESOTA, UNIVERSITY OF, Minneapolis, Minn., founded 1851. During the year 1900-01 the faculty consisted of 295 professors and instructors and the student-body 3,413, excluding duplicates, of whom 2,417 were men and 996 women. They were divided as follows: Graduates, 182; college, 1,083; engineering, 265; mines, 86; chemistry, 10; agriculture, 544; law, 463; medicine, 533; summer school, 290. The library contains about 84,000 volumes and 26,000 pamphlets. The summer school is organized under the authority of the department of public instruction in the interest of the teachers of the State. Instruction is given in two sections—(1) graduate work for high school teachers and (2) primary work for the needs of teachers of the primary and elementary grades. The government of the university is vested in a board of 10 regents, besides the governor, State superintendent of public instruction, and president of the university, who are members *ex-officio*.

MIQUEL, JOHANNES VON, Prussian statesman, died at Frankfort-on-the-Main, September 8, 1901. He was born at Neuenhaus, Hanover, in 1829, and was educated in law at Heidelberg and Göttingen, studying from 1846 to 1849. Settling at Göttingen as an advocate, he began to agitate with energy the idea of national federation, and in 1864 was elected to the second chamber of the Hanover diet. When the union of Germany was effected Dr. von Miquel assisted in drawing up a constitution for the North German confederation, and in 1867, after the annexation of Hanover to Prussia, was a member of the North German *Reichstag* and the Prussian house of deputies. As burgomaster of Osnabrück (1865) and later of Frankfort (1880), he showed unusual ability as a financier and organizer, and King William II. appointed him in 1890 Prussian minister of finance. This office he held until early in 1901, when he was forced to resign on account of his opposition to the king's plans for internal improvement in Prussia.

MISSIONARY ASSOCIATION, AMERICAN, a society of the Congregational denomination, founded in 1846, is American in its field, extending to Alaska and Porto Rico, and embracing institutions, ecclesiastical and educational, among the Indians, the Chinese, the negroes, and the mountaineers of the South. There are (1901) 755 missionaries engaged in the work, which comprises 110 schools of various grades with 16,566 pupils, and 249 churches with 13,482 members. The total amount received for current expenses was \$351,750.20, or, including the income from special funds, \$420,056.17—a substantial increase over the preceding year. The fifty-fifth annual meeting of the association convened in Oak Park, Ill., October 22-24, 1901, a feature of which was the public commendation of President Roosevelt's action in entertaining Booker T. Washington (*q.v.*). The *American Missionary* is published by the association. President, Rev. Washington Gladden, D.D.; corresponding secretaries, Rev. A. F. Beard, D.D., Rev. F. P. Woodbury, D.D., Rev. C. J. Ryder, D.D.; treasurer, H. W. Hubbard, Fourth avenue and Twenty-second street, New York City.

MISSISSIPPI, a Gulf State of the United States, has an area of 46,810 square miles. The capital is Jackson. Mississippi was organized as a Territory April 7, 1798, and admitted as a State December 10, 1817. The population in 1900 was 1,551,270, while in June, 1901, as estimated by the government actuary, it was 1,578,000. The population of the three largest cities in 1900 were: Vicksburg, 14,834; Meridian, 14,050; and Natchez, 12,210.

Finances.—The receipts of the treasury for the fiscal year ending September 30, 1901, were \$2,436,047.94, and balance on hand October 1, 1900, \$622,401.93, making a total of \$3,058,449.87. The expenditures for the year were \$2,229,996.02, leaving a balance in the treasury October 1, 1901, of \$828,453.85. On the same date, the total State debt amounted to \$2,887,026.96. Of this \$2,210,227.33, the interest of which is devoted to education, is non-payable, and \$676,799.63 is payable. The bonded payable debt of the State on October 1, 1901, was \$665,450. The debt was reduced by \$341,629.89 during 1900-01.

Industries.—Although an agricultural State, industries have grown steadily in Mississippi since 1850 and more especially since 1880. The population in the half century has increased 155.8 per cent. and the average number of industrial employees 737.6 per cent., embracing in 1900, 1.7 per cent. of the entire population. The actual capital, exclusive of capital stock, invested in 1900 in the 4,772 manufacturing establishments reporting, was \$35,807,419; the gross value of the articles manufactured was \$40,431,386; and their net value, exclusive of products re-used in the process of manufacture, was \$27,813,332. Inadequacy of transportation facilities and capital, and lack of water-power and good harbors has handicapped the industries. The most important manufacturing interest is the lumber and timber industry. This has increased 171.3 per cent. during the decade, the product in 1900 being valued at \$15,656,110, or 38.7 per cent. of the total value of the products of the State. And the increase is not likely to be checked in the near future, since the rolling pine lands of the interior have been very little exploited. Another industry that has increased notably in the decade is the manufacturing of cottonseed oil and cake. While in 1890 the products of this industry were valued at \$2,406,628, in 1900 they were valued at \$6,681,121, a gain of 177.6 per cent. Cotton ginning, holding third place in the State's industries, has practically arisen within the decade, its products for 1890 being valued at \$130,387, and for 1900 at \$2,214,949. Manufactures of turpentine and resin were valued at \$1,772,435 in 1900, as against \$282,066 in 1890, a gain of 528.4 per cent. The manufactures of cotton goods remained nearly stationary, being valued at \$1,472,835 in 1900, and \$1,333,398 in 1890. Like lumber products, planing-mill products showed great increase during the decade, rising in value from \$136,450 in 1890 to \$1,315,775 in 1900.

Forests and Forest Products.—The forests of Mississippi constitute its most valuable natural resource and the manufacture of lumber and timber products is the most important industry in the State, the output in 1900 being valued at \$15,656,110, or 38.7 per cent. of the total value of the products of the State and representing an increase in the value of the products during the decade of 171.3 per cent. Little valuable timber remains in the long-leaf pine region of the coastal plain; but the rolling pine lands of the interior, covering, it was estimated in 1897, 7,712,000 acres, have been little exploited.

Elections.—A special election was held on November 5, 1901, to fill the offices of State treasurer and secretary of state. The first of these was caused by the action of the governor in practically removing from office the State treasurer on charges of permitting a shortage in the State funds; the office of secretary of state fell vacant through the death of J. L. Power. At the election on November 5, G. W. Carlisle, who had been appointed temporarily by the governor as State treasurer, was confirmed in office by a vote of 12,932 against his leading opponent, Mr. Evans,

who received a vote of 9,424. For secretary of state, Joseph W. Power (Dem.) received a vote of 12,016, and his opponent, Mr. George (Dem.), a vote of 3,711.

State Officers.—Governor, elected in 1899 to hold office from January, 1900, until January, 1904, A. H. Longino; lieutenant governor, James T. Harrison; secretary of state, term two years, J. W. Power; treasurer, term two years, Geo. W. Carlisle; auditor, W. Q. Cole; attorney-general, Monroe McClurg; superintendent of education, H. L. Whitfield; land commissioner, E. H. Nall. Supreme Court—Chief justice, Albert H. Whitfield; associate justices, Samuel H. Terral and Solomon S. Calhoun—all Democrats.

Congressional Representatives (57th Congress).—In the House—E. S. Chandler, Jr., from Corinth; Thomas Spight, from Ripley; Patrick Henry, from Brandon; Andrew F. Fox, from West Point; John S. Williams, from Yazoo City; Frank A. McLain, from Gloster; and Charles E. Hooker, from Jackson—all Democrats. In the Senate—Hernando D. Money (until 1905), from Carrollton, and A. J. McLaurin (until 1907), from Brandon—both Democrats.

MISSOURI, a central State of the United States, situated in the Mississippi Valley, has an area of 69,415 square miles. The capital is Jefferson City. Missouri was organized as a Territory, December 7, 1812, and admitted as a State, August 10, 1821. The population in 1900 was 3,106,665, while in June, 1901, as estimated by the government actuary, it was 3,153,000. The populations of the four largest cities in 1900 were: St. Louis, the fourth largest city in the United States, 575,238, an increase of 123,468 since 1890; Kansas City, 163,752; St. Joseph, 102,979, and Joplin, 26,023.

Finances.—The receipts of the treasury for the year ending December 31, 1901, were \$5,127,414.67, the expenditures \$4,963,215.23, leaving in the treasury, January 1, 1902, \$1,243,130.97. During the year \$600,000 was paid on the State debt, which on January 1, 1902, amounted to \$1,287,000. All of this is bonded. The State tax rate for the year was 1 mill per \$1 valuation.

Industries.—The census reports for 1900 show that there has been a large growth in the manufacturing industries of Missouri during the last half century. Since 1850 the population has increased from 682,044 to 3,106,665, while the average number of industrial wage-earners has increased from 15,808 to 134,975, embracing in 1900 4.3 per cent. of the entire population, as against 2.3 per cent. in 1850. In 1900 there was invested in the 18,754 mercantile establishments reporting a capital, exclusive of capital stock, of \$249,888,581; at the same time the gross value of the products was \$385,492,784, and the net value, exclusive of products re-used in the process of manufacture, was \$256,671,841. Slaughtering and meat-packing is the most important industry of the State. Its products in 1900 were valued at \$43,040,885, representing an increase since 1890 of \$24,720,692, or 134.9 per cent. The principal centres of this industry are St. Joseph and St. Louis. The manufacture of tobacco ranks second among the industries of the State, having products in 1900 valued at \$27,847,432, an increase since 1890 of \$10,263,786, or 58.4 per cent. The manufacture of flouring and grist-mill products had products in 1900 valued at \$26,393,928, representing a decrease during the decade of \$8,092,867, or 23.5 per cent. The decrease was almost wholly in the city of St. Louis and was accredited to the opening up of less developed countries of the West and Southwest by railroad facilities, which connect the great grain-producing centres with the markets by shorter freight lines. Printing and publishing had products in 1900 valued at \$15,355,949. Foundry and machine-shop products were at the same time valued at \$15,073,005. The manufacture of malt liquors had products valued at \$13,776,905, representing a decrease since 1890 of \$3,177,232, or 18.7 per cent. The manufacture of shoes has made rapid advance in Missouri, although it is a comparatively new industry there. In 1890 its products were valued at \$11,253,202, an increase from 1890 of \$6,412,108, or 132.5 per cent. Other industries were as follows: lumber and timber products, valued at \$11,177,529; clothing manufactures, with products valued at \$8,925,088; the manufacture of steam railroad cars, with products valued at \$7,722,768; and car construction and general shop-work, with products valued at \$6,524,121.

Taxation of Mortgages.—By an act of the legislature, approved March 28, 1901, the end of an experiment was foreshadowed in Missouri, whose purpose had been to relieve owners of property from such a proportion of the taxes on their property as was represented by mortgages held against them. This experiment was put under way when a constitutional amendment was adopted, November 6, 1900, declaring that mortgages, deeds of trust, and other obligations by which a debt was secured should henceforth, for the purposes of taxation, be considered as an interest in the property affected, and that the value of the property, minus the value of the debt, was to be taxed to the owner of the property, while the value of the security was to be taxed to the owner thereof. The immediate result of this amendment was that several of the large loan and trust companies doing business in Missouri called in their mortgages and announced their intention of closing up their offices

in the State. Moreover, those companies which did remain, at once raised their interest rates on mortgages so as to counterbalance the additional taxes which they would have to pay under the new law. Other difficulties also resulted, the principal of which was a double taxation of mortgage debts. For by a prior law, mortgage debts were taxed as personal property, while by the new law they were taxed as an interest in realty. Furthermore, the law served at least to double the value of all encumbered property for purposes of taxation, unencumbered property being assessed, as usual, at a nominal value much below its real value. But as mortgages under the new law were based on real value, they could obviously be assessed only at their face value; and as the mortgage evidently did not represent the entire value of the property mortgaged, this mortgaged property had also to be assessed at its actual value. Or if it were not, then the holder of the mortgage had to pay a tax greater than the entire mortgaged property had paid when unmortgaged. In view of these defects in the law, the legislature endeavored to "interpret" the law for the benefit of the courts so long as the law should remain in force; but in March the legislature also adopted a concurrent resolution providing that on November 5, 1902, a proposition should be submitted to the electors for the repeal of the entire constitutional amendment.

Taxation of Franchises.—In accordance with a recommendation made by Governor Dockery, recommending the taxation of corporate franchises, a law was passed directing that the franchises of all railroad, street railroad, bridge, telegraph, telephone, water conduit, electric light, and gas companies, and other similar corporations operating and owning public or quasi-public utilities, should be taxed at the same time and at the same rate as taxes were levied on their actual and tangible property. The value of the franchise was declared in the act to be the difference between the tangible property of the corporation and the total valuation of its property. In theory the bill was admitted to be excellent, but in practice many thought that it would not result in a materially higher rate of taxation, for the reason, among others, that the State board of equalization was already accustomed to consider franchise valuations in making assessments.

Labor Laws.—Probably the most important of the labor laws enacted by the legislature was that creating, and defining the duties of, a State board of mediation and arbitration, to consist of three members, one an employer, one an employee, and the third apparently sustaining no fixed industrial relations whatsoever, for it was provided that he should be neither an employer nor an employee. It was made the duty of this board, whenever it heard of a strike involving ten or more persons, to put itself into communication with the parties to the dispute and to endeavor to bring about a settlement. Should all efforts at conciliation fail, the board was authorized to examine the causes and nature of the dispute, to subpoena witnesses, examine the affairs of the company, and within ten days after the completion of its examination publish its findings and its decision. A most drastic feature of this mediation act was as follows: "In all cases where any grievance or dispute shall arise between any employer and his employees, said dispute involving ten or more employees, it shall be the duty of the parties to said controversy to submit the same to said board for investigation." And again: "In all cases where the application for arbitration is mutual, or both parties agree to submit to the decision of the board, said decision shall be final and binding upon the parties concerned in said controversy and dispute. In all cases where either party to a dispute refuses to agree to arbitration the decision of the board shall be final and binding upon the parties thereto, unless exceptions be filed with the clerk of said board within 5 days after said decision is rendered and announced."

Another labor law provided for the appointment of a factory inspector and subordinates, to inspect all factories at least twice a year and see to it that all State laws regarding factories were enforced, and also all municipal ordinances, so far as these did not conflict with the State laws. An act for the protection of employees in relation to their wages provided that the operators of all manufacturing in the State should pay their employees at least every 15 days, and that at no pay-day should there be withheld from the earnings of any employee a sum to exceed the amount due him for his labor for the five days preceding such pay-day. And if the employer failed to conform to the provisions of this act, it was enacted that the employee might recover in suit double the amount due him, and this, notwithstanding any contract he might have made with his employer to the contrary. The existing law which made it unlawful for mines more than 200 feet below the surface to employ their workmen more than eight hours a day was amended by making eight hours the legal working day for all miners, and prohibiting corporations from working their hands longer. Another amendatory act prescribed that mine-owners must certify to the inspector of mines full particulars as to the value and size of their plants, the production of the mines, the price received for the output, the number of men employed, and the wages paid to them. This law was similar to

several passed in other States in recent years, which have been declared unconstitutional as embodying special and class legislation. A still more pronounced act of special legislation, however, passed by the Missouri legislature, made it the duty of all public officers in State, counties, and cities, who had charge of the erection and construction of public buildings, to provide in the specifications for such buildings for the reception of bids for stone quarried in Missouri, and in making awards to give the preference to bids for stone quarried in the State.

Other Legislation.—In accordance with a constitutional amendment adopted in November, 1900, permitting the legislature to draw upon the sinking fund, the legislature of 1901 appropriated \$1,000,000 therefrom to be used in erecting buildings and in arranging for the exhibit of Missouri at the St. Louis Fair, to be held in St. Louis in 1903. An act permitting the county court to direct that all prisoners in the county jail, except women, should work daily on the highways or at other employment, was amended by making it obligatory upon the county court to prescribe such employment. Kidnapping was made punishable by death or by imprisonment for not less than 5 years. An act to preserve the integrity of machine politics provided that "No political party hereafter organized, nor any persons hereafter nominating any candidate for office by petition, shall use any portion of the name of any political party now in existence, nor cause to be printed at the head of their ballots any name or names or device similar to that of any existing political parties." A law was passed defining more exactly what is meant by practicing medicine, declaring it to signify the curing or the attempting to treat the sick, whether they suffered from bodily or mental infirmities, and forbidding such practice except after examinations conducted by the State board of health. Christian Scientists were debarred by this act, but a special clause was inserted permitting medical practice by osteopaths. An act was passed creating a State library board, to consist of five members, who should select, classify, and recommend supplementary reference books for school libraries. One of the last acts of the Missouri legislature was to reduce the inspection tax on beer from 38 to 20 cents a barrel. This act was said to be the result of a compromise with the brewers, who agreed, in consideration of the reduced tax, to pay \$225,000 back taxes instead of contesting the validity of the law under which they were taxed and of incidentally "holding up" the State treasury until the case was decided. Congress was petitioned to call a convention to propose an amendment to the United States Constitution for the direct election of Senators. And in this petition Congress was reminded that the House of Representatives had four times within recent years adopted resolutions in favor of the amendment, but that the Senate had as often ignored the resolutions of the House. Another petition to Congress set forth that there were several thousand acres of government lands in Missouri from which the United States derived a very small income, but which Missouri could sell to much advantage and use the proceeds for school purposes; therefore Missouri requested Congress to give her the lands.

Proposed Amendments.—Besides the proposed amendment for the repeal of the mortgage tax law, the following amendments were directed to be submitted to the voters for ratification in November, 1902: (1) To confirm as sacred obligations of the State the State certificates of indebtedness held in trust for and owed to the public-school fund and the seminary fund; to extend and perpetuate the same; to provide for the payment of the interest thereon, and to provide for the future investment of school and seminary funds. (2) To permit St. Louis to levy for municipal purposes, in addition to the rate of taxation allowed to municipalities, a rate not exceeding the rate which would be allowed for county purposes if said city were a part of a county. (3) To modify that clause of the present constitution which enacts that the charter of St. Louis may be amended by a three-fifths vote of the people, but not oftener than once in two years, by providing that the charter may be amended at any time at a general or special election, each amendment being voted on separately and accepted by a three-fourths vote; and also to allow the charter to be revised at any time by a board of 13 chosen by the electorate, the charter as thus revised to be ratified by a majority of those voting at any election. (4) Providing that the constitutional debt limit of 5 per cent. for all cities and counties shall not be construed in the case of St. Louis to include the \$6,111,000 she assumed in the scheme of separation from the County of St. Louis, nor shall it include bonds for water-works already issued or to be issued; and providing in the case of Kansas City that the debt limit shall not apply to bonds previously issued or to be issued for that purpose. (5) Increasing in cities the amount of taxes which may be raised for school purposes. (6) Providing that cities of between 2,000 and 3,000 may, in addition to the allowed debt of 5 per cent. of assessed property, assume a debt of 5 per cent. more, to be used for the purpose of purchasing or constructing water-works, electric or other light plants to be owned exclusively by the city; provided, however, that the city incurring the extra debt shall at the

same time levy an additional tax sufficient to pay the interest and to constitute a sinking fund that will clear the principal in 20 years.

Protection for Street-Railway Employees.—On February 12 the Supreme Court of Missouri handed down the decision affirming the constitutionality of a law approved March 5, 1897, requiring all electric street cars to be equipped from the last of October to the 1st of April each year with screens or hoods protecting the motormen from inclemencies of the weather. Action was brought to have the law set aside on the ground, among other things, that it was special legislation, and that it would deprive the railroad companies affected of their property without due process of law. The court held, however, that the act was a just exercise of the police power of the State in preserving the health and lives of its citizens. The court also held that the fact that the legislature did not by this act endeavor to protect all citizens of the State, did not make the act special legislation, since it did endeavor to protect the health of all those who might become engaged in the occupation of a motorman.

State Officers.—Term four years—Governor, Alexander M. Dockery, Democrat; lieutenant-governor, John A. Lee; secretary of state, Sam. B. Cook; treasurer, Robert P. Williams; auditor, Albert O. Allen; attorney-general, Edward C. Crow; superintendent of education, William T. Carrington. Supreme Court: Chief justice, Gavon D. Burgess; associate justices, Thomas A. Sherwood, James B. Gantt, Theodore Brace, L. B. Valliant, W. C. Marshall, Democrats, and Waltour M. Robinson, Republican.

Congressional Representatives (57th Congress).—In the House: James T. Lloyd, from Shelbyville; William W. Rucker, from Keytesville; John Dougherty, from Liberty; Charles F. Cochran, from St. Joseph; William S. Cowherd, from Kansas City; David A. De Armond, from Butler; James Cooney, from Marshall; Dorsey W. Shackleford, from Jefferson City; Champ Clark, from Bowling Green; Richard Barthold, from St. Louis; Charles F. Joy, from St. Louis; James J. Butler, from St. Louis; Edward Robb, from Perryville; William D. Vandiver, from Cape Girardeau, and Maecenas E. Benton, from Neosho—all Democrats, except Richard Barthold and Charles F. Joy, Republicans. In the Senate: George G. Vest (until 1903), from Sweet Springs, and Francis M. Cockrell, from Warrensburg—both Democrats.

MISSOURI, UNIVERSITY OF, established 1839, located at Columbia, Mo., with a school of mines at Rolla. In 1900-01 Missouri joined the ranks of those institutions which have made the work of the academic department entirely elective. For graduation the student must pursue a major subject for four years and four other more or less closely related subjects for two years. The frank adoption of the elective principle and the new requirements for graduation are in line with a tendency which is becoming more widespread every year, a subject which is discussed in the article *UNIVERSITIES AND COLLEGES* (q.v.). An important change has also been made in connection with entrance to the academic departments. Since 1897, 12 units have been required for entrance, but students who passed on 10 units have been admitted on condition. Hereafter 12 units without conditions will be absolutely required. By a further revision of entrance requirements, also, 3 of the 12 units must be in English, 2 in mathematics, and 2 in foreign languages, the other 5 being elected from an offered list of 19 subjects. Beginning with the session of 1901-02, the B.S. and M.S. degrees will no longer be conferred in the academic department. It will be observed that the abolition of the B.S. degree is the natural result of the adoption of the elective system, under which it is possible for a candidate for the B.A. degree and a candidate for the B.S. degree to do exactly the same work. It is, moreover, in accord with an increasing tendency at many of the leading colleges and universities. These various changes are of especial interest as showing that the educational impulses which are manifesting themselves in the institutions of the East and West are also affecting the future great universities which are growing up in the southwestern States of the Union. The statistics showing the election of studies by classes agree in general with those of other universities that have adopted the broad elective system, in showing a judicious choice of subjects and a tendency to select the traditional studies in the field of the humanities. The university is further identifying itself with general educational movements by action which will lead to the adjustment of the work of the academic department with that in law and medicine, so that a student may complete in six years the work required for the B.A. degree and that required for the M.D. or LL.B. degree. The law-school course has been extended to three years, beginning with the fall of 1901, and the standard of admission raised to correspond with three years in the high school. A chair of obstetrics and gynecology was established in the medical department in 1901, and a new \$40,000 medical building will soon be erected. The college of agriculture received an appropriation of about \$130,000 from the legislature, a large part of it for buildings. The total endowment of the

university is now \$2,486,555, of which \$1,235,849 represents funds, \$145,706 property, and \$60,000 value of land endowment. The present income (biennial) is estimated at about \$833,000.

In 1901 the library contained about 40,000 volumes. The teaching force numbered 109 and the student-body 1,140. The latter were distributed as follows: Graduate department, 50; academic, 449; law, 125; medicine, 85; agriculture and mechanic arts, 254; mines and metallurgy, 177. See **PSYCHOLOGY, EXPERIMENTAL**.

MONAZITE. The production of monazite in the United States in 1900 was 908,000 pounds, valued at \$48,805, as compared with 350,000 pounds, worth \$20,000, in 1899. Monazite furnishes the oxide of thorium used in the manufacture of mantles for incandescent gaslights. It is from this mineral that Baskerville in 1901 obtained a new substance which may possibly prove to be an element. See **CHEMISTRY**.

MONKHOUSE, WILLIAM COSMO, English writer on art, died at Skegness, Lincolnshire, July 20, 1901. He was born in England, March 18, 1840, and was educated at St. Paul's School, London. Entering the Board of Trade in 1857 as a clerk, he rose to the position of assistant secretary of the financial department, and served on various committees. It was as an art critic that Mr. Monkhouse won his greatest reputation, and his monograph on Turner (1879), as well as his volumes, *The Earlier English Water-Color Painters* (1890), *The Italian Pre-Raphaelites* (1887), *In the National Gallery* (1895), and *British Contemporary Artists* (1899), appealed strongly to popular taste. Mr. Monkhouse published three volumes of poems—*A Dream of Idleness* (1865), *Corn and Poppies* (1890), and *The Christ Upon the Hill* (1895)—and numerous biographies, as well as a novel, *A Question of Honor* (1868).

MONTANA, a northwestern State of the United States, has an area of 146,080 square miles. The capital is Helena. Montana was organized as a Territory, May 26, 1864, and admitted as a State, November 8, 1889. The population in 1900 was 243,329, while in June, 1901, as estimated by the government actuary, it was 254,000. In 1900 the three largest cities and their populations were: Butte, 30,470; Great Falls, 14,930, and Helena, 10,770.

Finance.—The receipts of the State treasury for the year ending November 30, 1901, were \$1,343,838.75, and the expenditures were \$1,303,779.04, leaving in the treasury, when taken in conjunction with the previously existing surplus, a balance of \$554,686.87. The State tax rate for the year was 2½ mills on the dollar, and the total value of State property, as returned for taxation, was \$166,787,593. This amount represented an increase during the year of somewhat over \$14,000,000. Montana has no bonded indebtedness of any kind.

Industries.—The census reports of 1900 show a considerable increase since 1890 in the manufacturing interests of Montana, although these are inconsiderable as compared with mining, stock-raising and agriculture. During the decade the population advanced from 20,595 to 231,559 and the average number of industrial wage-earners from 701 to 10,117, embracing, in 1900, 4.2 per cent. of the total population. The amount of actual capital, exclusive of capital stock, invested in the 1,080 establishments reporting in 1900 was \$40,945,846. The gross value of the products, inclusive of material re-used in the process of manufacture, was \$57,075,824. The smelting and refining of copper and lead are the most important industries, with a product in 1900 valued at \$36,387,063, more than 60 per cent. of the total product of the State. Four factors favor the development of this industry: Large deposits of ore, abundant water power of the Missouri River within easy reach of the copper district, large coal production nearby, and the great available supply of timber suitable for use in the mines. Other industries, with values of products in 1900, are as follows: Flour and grist milling, \$995,702; slaughtering, \$934,640; malt liquors, \$1,276,331, and coke, \$356,190. Montana contains 12,000,000 acres of timber land. Numerous sawmills turned out in 1900 a product valued at \$2,949,992.

Labor and Mining Laws.—In his annual message to the legislature, which convened in January, 1901, the governor stated that laws for the relief of laborers, and especially for those engaged in mining, had been a predominant issue in the late campaign, and that the legislature was now bound in honor to pass such laws. Although the constitution of Montana provides that no law shall be passed impairing the obligation of contracts, conferring special benefits or immunities to any persons or corporations whatever, and also that no local or special laws shall be enacted, nevertheless, the legislature, in accordance with the governor's recommendation, passed a law limiting to eight hours a day the period of employment for all workmen in underground mines and smelters, and employees in other institutions for the reduction and refining of ores. Other acts directed to the same end of securing relief for miners provided for the appointment of an inspector of mines, to see that all State regulations were carried out regarding precautions to be taken for the safety of workmen, and it was also provided that miners might employ, at their own

expense, a check weighman, who should have equal rights in the weighing of coal with the regular weighman, and that both the regular and check weighmen should subscribe to an oath before a justice of the peace to do justice between employer and employee in the weighing of coal. Finally an act was passed prohibiting employers from paying their workmen by script, token, credit, or by anything else except lawful money of the United States, and prohibiting also the assignment of wages by employees to their employers. The necessity for this act arose, it was alleged, from the fact that nearly all mining corporations in the State kept a "company store," at which the employees were practically forced to make their purchases, the company at the end of the month deducting from the employee's wages the amount of his bill, and then giving a company check for the balance, good only for further purchases at the store.

Other Legislation.—Among other acts was one permitting the practice of osteopathy by persons passing examinations prescribed by a board of osteopathic examiners; an act establishing a uniform system of road government and administration in the counties of the State; an act providing for the completion of the buildings of the University of Montana, and a law amending the election regulations. This latter provided that only those persons could vote at a primary who intended to vote with the party holding the primary at the ensuing elections, and provided also that at all elections a cross must be placed by the voter against every person voted for; that is to say, straight-ticket voting was abolished, it being stated that corporations interested in the political complexion of the State had found means by tissue ballots and otherwise to ascertain under the old system how their employees voted. A resolution introduced into the legislature providing for a constitutional amendment by which the legislature would be enabled to control contracts between employers and employees failed of passage. While the terms of the amendment were particularly objectionable to those not opposed to all capitalists, the failure of the proposal was nevertheless significant as showing a great modification of the legislature's anti-trust attitude two years previous.

Elections.—The largest part of the time of the Montana legislature, which met in January, was devoted to the election of two United States Senators. One of these elections was for the full term ending March 4, 1907, and the other was for the unexpired portion of the term ending March 4, 1905. The former vacancy was caused by the expiration of the term of Thomas H. Carter (Rep.), and the other by the resignation of William A. Clark (Dem.), on May 11, 1900. In the elections of 1900 for members of the State legislature, the Democrats secured a majority in both houses, and on January 16, 1901, William A. Clark was elected for the full six-year term. On the candidate for the shorter term, however, the legislature could not agree, and it was not until March 7, the last day of the legislative session, when 22 ballots were taken, that Paris Gibson was elected for the four-year term. The election of Mr. Clark followed a battle which he had made since 1893 to have himself placed in the United States Senate. At that time (1893), Mr. Clark was the caucus nominee of the Democratic party, which controlled the legislature. But Mr. Marcus A. Daly, belonging to the same political party as Mr. Clark, but a bitter personal enemy, succeeded in preventing his election. In 1899, however, Mr. Clark was elected for the six-year term ending 1905; but Mr. Daly then preferred charges of bribery against him in the United States Senate, and an investigating committee recommended that his name be dropped from the rolls. On May 11 Mr. Clark resigned from the Senate and was immediately reappointed by the acting governor, the governor, an opponent of Mr. Clark, being absent from the State. The Senate deferred action upon these new credentials of Mr. Clark, and on January 16, 1901, Mr. Clark was elected by the legislature, thus giving the Senate no excuse to further contest his seat.

State Officers.—Elected in 1900 for four years: Governor, Joseph K. Toole, Fusion Democrat-Populist, term expires January, 1905; lieutenant-governor, Frank G. Higgins; secretary of state, George M. Hays; treasurer, A. H. Barret; auditor and insurance commissioner, J. H. Calderhead; attorney-general, James Donovan; land commissioner (appointed), Henry Neill; superintendent of education, W. W. Welch. Supreme Court: Chief justice, Theodore Brantley, Republican; associate justices, G. R. Milburn and W. T. Pigott, Democrats.

Congressional Representatives (57th Congress).—In the House: Caldwell Edwards, Populist, from Bozeman. In the Senate: Paris Gibson (until 1905), from Great Falls, and William A. Clark (until 1907), from Helena—both Democrats.

MONTENEGRO, an independent principality in southeastern Europe, constituting one of the Balkan states, has an estimated area of 3,630 square miles and a population of about 228,000. The capital is Cetinje, with 2,920 inhabitants. The Montenegrins are of Slavic origin, belonging to the Servian branch of that race. Nearly the whole of the population is engaged in agricultural and pastoral pursuits. The predominating religion is that of the Greek Orthodox Church. The govern-

ment is patriarchal, the executive power being exercised by the reigning prince, Nicholas I., who is assisted by a council of eight members, half of whom are appointed by the prince and half elected by the male inhabitants who are bearing, or have borne, arms. Practically, the council is of little importance, and the will of the prince is absolute. Administratively, the tribal organization is still in existence, the country being divided into 40 districts, corresponding to as many tribes, each being governed by elected "elders" and a chief, or captain, who acts as a magistrate in time of peace and a military officer in war-time. There is no standing army, but all male inhabitants are liable for military duty. The public revenue, of which there is no published record, is estimated at about 2,000,000 kronen, derived from land and cattle taxes, customs duties, and government monopolies. The country is very mountainous, little of it being fit for cultivation. Agricultural methods are still in a primitive state, and the crops are scarcely more than sufficient to supply the home demand. The exports are chiefly pastoral, including live-stock, hides, dried meats, wool, cheese, beeswax, and honey. In 1898 the exports were valued at £98,330 and the imports at £118,069.

It was announced in the summer of 1901 that the government had let a contract for the construction of a narrow-gauge railway from Antivari to Niksic, about 95 miles distant, and also for important harbor improvements in the former town. The cost of the road, including rolling stock, is estimated at about \$2,230,000, and that of the port works at about \$250,000. This enterprise will facilitate mineral and forest exploitation. According to contract the railway will be finished by July 1, 1904, and the port works by January 1, 1903.

Early in the year M. Petrovitch, the president of the council, made a trip to Italy to study local government, and upon his return extensive reforms in Montenegro were instituted. The first reform was the remodeling of the district administrations on modern lines, and all the chiefs were called to the capital to receive instructions in the new methods. Universal suffrage was established for the districts, the people gaining an increased influence in the government. On the fiscal side the reforms gave the districts control over their own finances, it being decreed that henceforth the local revenues shall be employed only in the districts, and not in external affairs.

MONTSERRAT. See LEeward ISLANDS.

MOORE, ELIAKIM HASTINGS, professor of mathematics in the University of Chicago, was elected to membership in the National Academy of Sciences at its spring meeting in 1901, in recognition of his valuable mathematical researches. Professor Moore was born at Marietta, O., January 26, 1862, and graduated from Yale University in 1883, two years later receiving the degree of doctor of philosophy. After studying abroad for several years, he returned to New Haven to join the teaching staff of the university. In 1889 he was called to Northwestern University as assistant professor of mathematics, and in 1892 he was appointed professor of mathematics in the University of Chicago, becoming head professor in 1896. Dr. Moore has taken an active interest in the American Mathematical Society, serving for several years as editor of its *Transactions*, and as its president in 1901. He is a member of the prominent European mathematical societies, and has published many papers on mathematical subjects.

MOORE, Rt. Rev. JOHN, Roman Catholic bishop of St. Augustine, Fla., died in that city, July 30, 1901. He was born at Castletown, County Westmeath, Ireland, June 27, 1835, and went to Charleston, S. C., in 1848, where he was educated at the Collegiate Institute. Later he studied classics and philosophy in France, and theology in Rome, and was ordained a priest in 1860. For a time he was assistant, and then pastor of the Charleston cathedral (1860-65), from which church he was transferred to St. Patrick's, in the same city, in 1865, where he remained until 1877, serving also (1872-77) as vicar-general of the diocese of Charleston. He was consecrated bishop of St. Augustine, Fla., in 1877.

MORAN, EDWARD, marine artist, died in New York City, June 9, 1901. He was born at Bolton, England, August 19, 1829, and after coming to the United States (1844) followed the trade of weaver in Philadelphia. Acting upon the advice of friends, he devoted himself to art, and went to New York City, in 1874, where most of his important work was done. He was an indefatigable worker, principally on marine subjects, and a great number of his paintings survive in private and public collections. A series begun twenty years ago, and representing the naval history of the United States in thirteen paintings, was, perhaps, Mr. Moran's most ambitious work. This was finished soon after the close of the Spanish-American War with "The Return of the Conquerors, Typifying the Victory of the Navy in the War with Spain." He was also notable as an etcher.

MORAVIAN CHURCH, or **UNITAS FRATRUM**, founded in 1426, and after apparent extinction through persecution, revived in 1727, has developed, in the

United States, its greatest strength in the State of Pennsylvania. The church has (1901) a total membership of 135,565, included in the mission churches and in the three provinces: American, 23,467 members, of whom 14,917 are communicants, with 111 churches and 120 ministers (6 bishops); European, 8,787 members, 6,482 communicants; British, 5,955 members, 3,314 communicants. These provinces constitute an organic whole, and the foreign mission work, begun in 1732, a notable department of Moravian activity, is directed by a general missionary board, which oversees an extensive field, where there are 460 missionaries, besides native laborers and assistants, and 96,877 members, 32,028 of whom are communicants. The missions of the church in Greenland, where there were 6 stations and 33 out-stations, with nearly 40 workers, have been transferred to the church of Denmark. Home missionary work is carried on in various parts of the United States and in Canada, and several educational institutions, including a college and a theological seminary, are maintained. The publication office of the church is at Bethlehem, Pa. During the year, in addition to the regular periodical literature and official church publications, a *History of the Moravian Church During the Eighteenth and Nineteenth Centuries* and a *History of Moravian Missions*, both edited by Dr. J. Taylor Hamilton, have been favorably received. The Bach festival, held in May in the old Moravian Church at Bethlehem, was chronicled as one of the musical events of the year—a celebration of religious as well as of musical significance in its illustration of the musical tendency of the Moravian liturgy. The festival, in some quarters hailed as an American Oberammergau, in others was received as the possible inception of an American Baireuth.

MOREAU, Rt. Rev. LOUIS ZEPHIRIN, Roman Catholic bishop of Montreal, died at St. Hyacinthe, Canada, May 24, 1901. He was born at Bécancour, Canada, April 1, 1824, and was educated at the Nicolet Seminary. Ordained priest in 1846, Father Moreau became assistant secretary to the bishop of Montreal, and in 1852 went to St. Hyacinthe as secretary to Monsignor Prince. He became, in 1869, vicar-general of that diocese, and was consecrated bishop in 1876. During his service Bishop Moreau established two new religious communities, instituted a diocesan chapter, and built many churches, academies, and schools.

MORELLI, DOMENICO (real name, DOMENICO SALIERO), Italian painter, died at Naples, August 13, 1901. He was born at Naples, in 1826, and was educated in art first in the Naples Academy; then, having won a government scholarship, at Rome, under Guerras, and, later, Overbeck. In the national uprising of 1848-49 he was wounded while defending a barricade in the streets of Naples, but later he returned to his studies, and won a gold medal at the Naples Exposition of 1855. He was a medalist also at the national exposition of 1861, and at Paris in 1867. Afterward he became a teacher in the academy at Naples, and from 1886 was a member of the Italian senate. Among his important pictures are "The Assumption," in the Royal Chapel, Naples; "The Temptation of St. Anthony;" "Christ and Magdalen;" a "Madonna and Child," in the church of Castellain, which has been praised by Villari, and "Christ on the Sea." He also assisted in the decoration of the cathedral at Cosenza.

MORGAN, JOHN PIERPONT, the most prominent of American bankers, succeeded in 1901 in bringing into a single combination, under the name of the United States Steel Corporation (*q.v.*), practically all of the iron and steel industries of the United States. This colossal organization, capitalized at \$1,404,000,000, was Mr. Morgan's idea, and it was through his efforts that the various interests were brought together with the object of effecting economy in management and production, and of obviating the effects of ruinous competition. Mr. Morgan was also prominent during the year by reason of the part he took in the struggle for the control of the Northern Pacific Railroad, and in averting the panic that threatened to result. Control of the old Leyland line of steamships passed to him in 1901, and persistent rumor connected him with a huge shipping combination designed to include practically all of the transatlantic trade. All of his activity in the way of combination has been based on the single idea of community of interest, which he believes to be directly opposed to the old "trust" principle. Mr. Morgan's skill has been principally directed toward reorganizing non-paying properties and cutting out expenses due to duplication of production and harmful competition. He was born at Hartford, Conn., April 17, 1837, and was educated at the Boston English High School and at the University of Göttingen, Germany. In 1871 he joined the firm of Drexel, Morgan & Co., bankers, which later became J. P. Morgan & Co. Among his achievements may be mentioned the negotiation of the bond issues of the United States during the Cleveland administration, the reorganization of the West Shore Railroad, and the consolidation of the "coal roads," including the Philadelphia and Reading. In 1900 he was instrumental in settling the strike of the miners in the anthracite coal region of Pennsylvania.

MORMONS, or LATTER-DAY SAINTS. The *Church of Jesus Christ of Latter-Day Saints* was founded in 1830 by Joseph Smith, the prophet of Mormonism and the author of a legendary history of ancient America, the Book of Mormon, which with the Bible, and the Doctrine and Covenants, and the Pearl of Great Price, constitute the written standards of the church. It is organized, for purposes of ecclesiastical administration, into "stakes of Zion," each consisting of a group of "wards," the residents in which compose the individual congregations. There are now 64 "stakes and missions" (8 new "stakes" having been formed during the year 1901), with a total membership approximating 350,000, in settlements not only distributed throughout Utah, where there are 30 "stakes," but found also in Arizona, New Mexico, Nevada, Colorado, Wyoming, Idaho, Montana, and Oregon, and in Canada and Mexico. A "stake" in most instances is co-extensive with a county. The hierarchy of the church, intricately organized, consists of about 36,000, including apostles, patriarchs, high priests, seventies, elders, bishops, priests, teachers, and deacons. There are about 1,100 Sabbath schools, in which are enrolled 130,000 teachers and scholars. Foreign missionary progress during the year has been accomplished in the establishment of new missions in Japan and Guatemala, the renewal of work in and near the City of Mexico, the acquisition of a site for the headquarters of the Scandinavian mission in Copenhagen, Denmark, and the translation of the Book of Mormon into the Tahitian and Samoan languages. The enterprise of the Mormon missionary propaganda is well known; its methods discourage centralization and affect colonization, tending toward a wider distribution of the Mormon faith. The Borough of Brooklyn, New York City, and Chattanooga, Tenn., are cited as important centres of missionary activity. About 1,700 missionaries are now maintained in the various fields, which comprise, besides the United States, Great Britain, Scandinavia, Germany, Holland, Switzerland, the Turkish empire, New Zealand, Australia, and many of the Pacific Islands. The educational institutions include Latter-Day Saints' University, at Salt Lake City; Brigham Young College, at Logan, Utah, and a dozen or more academies. Among a number of denominational periodicals are the *Deseret News*, daily and semi-weekly (Salt Lake City) and the *Millennial Star* (Liverpool, England). During the year notable losses were experienced in the deaths of Lorenzo Snow (*q.v.*), fifth president of the church, and of George Q. Cannon (*q.v.*), his first counsellor. General conferences of the church are held annually, usually in Salt Lake City, and quarterly conferences in each "stake." Besides these customary gatherings, a special meeting this year was convened on November 10 to ratify the selection by the apostles of the general authorities of the church. These were: Joseph F. Smith as president, in succession to the late Lorenzo Snow, and John R. Winder and Anthon H. Lund as first and second counsellors in the first presidency, Brigham Young as president of the twelve apostles, and John Smith as presiding patriarch of the church.

Reorganized Church of Jesus Christ of Latter-Day Saints.—This seceding branch of the larger body, with headquarters at Lamoni, Ia., was organized by participants in the Josephite schism at the death of Joseph Smith. It bases its polity on the Apostolic Church, and while accepting the Book of Mormon as of divine origin, repudiates polygamy and questions the authority of its revelation by Brigham Young. The reorganized church now has a membership of from 45,000 to 50,000, with about 740 ministers, 175 church edifices, with property estimated at \$800,000, and 625 local organizations scattered throughout the United States, Canada, the British Isles, Scandinavia, Australia, and the Society and Sandwich Islands. There are two "stakes of Zion," one at Lamoni, Ia., and the other at Independence, Mo., and mission and district conferences in different parts of the world. The church controls Graceland College, at Lamoni, Ia., now in its seventh year, and maintains two publishing houses at Lamoni and Independence, the former numbering among its issues the *Saints' Herald*, the official organ, which has a circulation of about 4,500. The books published during the year include, among others, *General Conference Resolutions* (1852-1900) and *Truth Defended*, a reply to *Doctrines and Dogmas of Mormonism*. Yearly conferences of the church are held, that of 1901 being in session April 6-20 at Independence, Mo. President of the Reorganized Church, Joseph Smith; secretary, R. S. Salyards; patriarch, A. H. Smith; bishop, E. S. Kelley.

MOROCCO, a Mohammedan empire in northwestern Africa. The seat of government, or residence of the sultan, is alternately at Fez, Morocco City (Marakesh), and Mekines.

Area and Population.—Since the southern boundaries are undefined, no approximately accurate estimate of the area of Morocco can be made, but the figure usually accepted is 219,000 square miles. The population is variously estimated; 4,000,000, perhaps, is the most nearly correct. The inhabitants belong to the Malekite sect of the Sunnite Mohammedans.

Government, etc.—The sultan, who is assisted by six ministers of state, is the supreme head of both civil and religious law. The present sultan is Mulai-Abd-el-Aziz, who was born February 24, 1878, and succeeded to the throne in June, 1894. The army comprises about 10,000 infantry and 400 cavalry; in addition there are some 2,000 irregular cavalry and militia forces, foot and horse, amounting to about 18,000. The annual imperial revenue, derived largely from monopolies, taxes, and extortions, is estimated at about \$2,400,000.

Industries and Commerce.—The leading agricultural products include cereals, pulse, fruits, esparto, and hemp. The mineral resources are undeveloped. The imports and exports in 1899 were reported at \$5,071,000 and \$5,082,500 respectively; in 1900, \$7,925,200 and \$8,675,500 respectively. Great Britain stands first in the importance of its trade with Morocco, with France and Germany ranking next. The principal imports are cotton goods and other textiles, sugar and provisions, and iron ware. The values of the leading exports in 1900 were reported as follows: Almonds, \$1,621,800; beans, \$971,300; eggs, \$834,300; peas, \$737,700.

History.—In June, 1901, the minister of war, Kaid Mehedi el Menebhi, arrived in England to congratulate King Edward on his accession. Kaid Mehedi's mission then went to Berlin, and another mission to Paris and St. Petersburg, for what were supposed to be diplomatic purposes.

It will be remembered that from the time of the new sultan's accession he was completely dominated by the powerful grand vizier, Sid Ahmed Ben Musa, until the latter's death in May, 1900. After the death of Sid Ahmed the young sultan emerged from his seclusion and, to some extent, at least, has insisted on exercising his authority. "The northern blood inherited from his Circassian mother has rendered him not a little susceptible to European influence, though possibly not to his own advantage." He makes no secret of his desire to take up the difficult task of introducing reforms into every branch of the government. It is not unlikely that he would meet with success in this attempt if he had honest and open-minded counsellors to rely upon, but he is much hampered by the influences that surround him. Kaid Mehedi, who was "an understudy of Ahmed Ben Musa," has become the most important minister of state; upon him seems to have descended both the energy and the influence of that unscrupulous official. The immediate successor of Sid Ahmed was Haj Mukhtar, an old man, who reluctantly accepted the position; and who, having suffered the confiscation of his property in May, 1900, through the influence of Kaid Mehedi, was sent a prisoner to Fez. An important reform was accomplished by the sultan in September, 1901, when he abolished customs duties at Moorish ports on grain, vegetables, fowls, and eggs coming from other Moorish ports. He also announced a new system of taxation, by which especially appointed and salaried officials, instead of the provincial governors, will collect the taxes, and he said that bribery and extortion must be abandoned. In October, 1901, the sultan stated his intention to carry out a thorough reform in the administration of the prisons, the condition of which throughout the country was shocking.

Trouble with Spain was threatened in the fall of 1901. A Spanish boy and girl were abducted from Arzila, about 20 miles from Tangier, by Kabyle tribesmen. Spain entered protest and demanded the payment of \$1,000 daily until the captives should be released. In September it was announced that Moorish troops had been sent to subdue the Kabyles, who appeared to be in rebellion, and to obtain the liberation of the captives. This measure, however, failed, and in November the Moorish government paid to the Spanish government an indemnity of \$30,000, together with \$1,600 as compensation for the parents of the children. At the same time it was reported that private measures were being taken for their release. During 1901 several tribes in various parts of the country were in rebellion.

France and Morocco.—The rumored designs of France against Morocco, so frequent in 1900, continued in 1901. According to a report emanating from Rome in April of the latter year, negotiations were at that time in progress among Great Britain, France, Italy, and Spain, whereby Italy would take possession of Tripoli (an Ottoman dependency), Great Britain of Tangier, and France of all the rest of Morocco. The belief in the aggressive attitude of France was strengthened, early in the summer, by the appearance of two French warships at Tangier, and especially by the "extraordinary" Moorish embassies to Paris, London, Berlin, and St. Petersburg. At Paris the Moorish envoy made unsuccessful efforts toward the fixation of the Algerian boundary; a *modus vivendi*, however, was established with regard to the frontier, and France secured, among other things, promises of the abandonment of the Sahara by Morocco, the early opening of new districts to French trade, and the pacification of the regions bordering on the Algerian hinterland. Meanwhile, although it was stated that the sultan had given satisfaction on the several questions pending between the two governments, it was openly urged that France take prompt action for the acquisition of Morocco. This policy was advocated by M. de Cassagnac. Although the more conservative French journals feared that annexation would

precipitate war, other influential papers held that the time for France to unveil her real designs upon Morocco had come, especially since Spain was still weak on account of the war with the United States, that Germany seemed to have abandoned her interest in the Moorish question, and that Great Britain, on account of the war in South Africa, could exert no effectual protest. On the other hand, it was believed in some quarters that, even though left free by the other nations, France would find the effectual subjugation of the Moors exceedingly costly, if not impossible.

MORPHOLOGICAL SOCIETY, AMERICAN. See **ZOOLOGICAL SOCIETIES.**

MORRIS, First Baron, **MICHAEL MORRIS**, former chief justice of Ireland, died at Spiddal, County Galway, Ireland, September 8, 1901. He was born in Galway, November 14, 1827, and was educated at Galway College and at Trinity College, Dublin. Graduating as senior moderator in 1847, he began the practice of law two years later, and in 1863 was made a queen's counsellor. He was returned to Parliament from Galway in 1865, and a year later accepted the place of solicitor-general for Ireland, becoming attorney-general a few months afterward. For nine years from 1867 he was a justice of the Court of Common Pleas, and for eleven years (1876-87) chief justice of the same court. Lord Morris became lord chief justice of Ireland in 1887, and in 1889 entered the House of Lords and was made a privy councillor. In addition to his judicial position he held, at the time of his death, the presidency of the Board of National Education, and was senator and vice-chancellor of the Royal University, Ireland.

MOSQUITOES. See **INSECTS AND THE PROPAGATION OF DISEASES, ENTOMOLOGY, and MALARIA.**

MOUNT, **JAMES ATWELL**, ex-governor of Indiana, died at Indianapolis, January 16, 1901. He was born in Montgomery County, Ind., March 23, 1843, and received but a meagre education at a country school. He served through the Civil War in the famous Wilder Brigade and at its close attended the Lebanon Academy in his native State for a year, completing a two years' course in that time. He was State senator for one term, 1888-90, as a Republican, and was defeated for Congress in the latter year. He was governor from 1897 to 1901. Governor Mount was known for his ability as an orator, his activity in the general councils of the Presbyterian Church, and his success as a farmer. In 1900 he came into particular prominence through his refusal to respect a requisition for Governor Taylor, of Kentucky, when he was wanted for alleged complicity in the murder of William Goebel.

MRAK, Very Rev. **IGNATIUS**, Roman Catholic Bishop of Marquette, Mich., died on January 2, 1901. He was born at Hotoula, province of Carniola, Austria, October 16, 1810, ordained to the priesthood in 1837 and after a period of labor in his native province came to America in 1845 to assist Bishop Baraga in missionary work among the Indians of northern Michigan. He resigned active work in 1878 on account of physical infirmities. At his death he was second Bishop of the diocese of Sault Ste. Marie and Marquette, and titular Bishop of Antinol.

MUHLENBERG, **FREDERICK AUGUSTUS**, D.D., American educator, died at Reading, Pa., March 21, 1901. He was born at Lancaster, Pa., August 25, 1818, and after graduating at Jefferson College in 1836 took his degree in theology at Princeton two years later. From 1838 to 1850 he was professor of Greek at Franklin College, from then until 1867 at Pennsylvania College, resigning in that year to become president of Muhlenberg College, founded in honor of his grandfather, Heinrich Melchior Muhlenberg, organizer of the Lutheran Church in America, and from 1876 to 1891 was professor of the Greek language and literature at the University of Pennsylvania. Dr. Muhlenberg was ordained to the Lutheran ministry in 1855, but was never a pastor, his activity being applied chiefly to educational work and the preparation of numerous contributions to the religious publications of his denomination.

MUNICIPAL BATH-HOUSES. According to the *Bulletin* of the United States Department of Labor for September, 1901, 23 of the 135 cities having a population of 30,000 or over in 1900, operate municipal bath houses. That some of these must be mere out-of-door bathing places is evident from the small sum required for their operation, as shown from the following figures for the fiscal year 1900 or 1900-01: New York, \$52,393; Chicago, \$10,623; Philadelphia, \$10,000; Buffalo, \$1,077; Syracuse, \$5,720; Albany, amount not given; Cambridge, \$1,331; Hartford, \$2,433; Boston, \$110,312; Baltimore, \$4,260; Washington, \$1,011; Newark, \$5,893; Rochester, \$2,481; Worcester, \$505; Nashville, \$2,433; Wilmington, \$247; New Bedford, \$774; Des Moines, \$979; Hoboken, \$1,552; Peoria, \$450; Yonkers, \$2,723; Holyoke, \$409. How important it is that bathing facilities for the dwellers in tenement houses should be furnished by the municipality is pointed out by M. N. Baker in the chapter on "Public Bath and Wash-Houses" in his recent book on *Municipal Engineering and Sanitation* (New York). Many of these families live in such crowded quarters that not only are there no bathrooms, but the privacy required for a sponge bath is un-

attainable. Such a state of affairs constitutes a social as well as a sanitary menace to the welfare of the community. As Mr. Baker states: "Personal cleanliness is the foundation of all cleanliness, and hence one of the most important of civic virtues. A clean body will not tolerate dirty clothing, or a dirty home, or dirty streets. The securing of universal cleanliness would do much to solve the problem of the slums. For it is not their poverty or their ignorance, but their filth, which constitutes the barrier between the very poor and the rest of society."

MUNICIPAL GOVERNMENT. *Saloons in New York City.*—One of the most perplexing municipal problems in the United States and one which was brought very prominently to public attention by the municipal campaign in New York in the fall of 1901 (see article New York, paragraph Municipal Campaign) was that of the regulations which should be made governing the sale of liquor in large cities. While the size, the cosmopolitan population, and the laws relating to liquor selling in New York City doubtless aggravated the situation there, yet the problem of saloons in New York was stated to be probably similar in kind, if not in degree, to that of every large city. The situation in New York as developed by the campaign was virtually as follows:

For many years the State legislature, dominated as in most States by the rural element, had passed impartial laws, without regard to organic differences of conditions, applying equally to both cities and towns. These laws culminated in the so-called Raines law of 1896 as amended in 1897. By this law the sale of liquor in New York City on Sunday was prohibited except under specified conditions. The public sentiment in New York was and for a long time had been so opposed to a country Sabbath that the law was unenforceable. While this law was unenforceable as a whole, however, it was of course possible for the police to close any particular resort or series of resorts, and thereby sprang up naturally, and it was alleged inevitably, a system of wholesale bribery of the police. If saloons paid the police for protection they were allowed to remain open in violation of the law; if the saloons did not pay they were closed. Now, when saloons paid for protection they became, speaking broadly, disreputable from that very fact; and in endeavoring to regain the money paid to the police they often attempted to combine, and in fact did combine, the profits of liquor selling with the profits of prostitution. And in this double business they were powerfully aided by the Raines law which allowed saloons to remain open on Sunday provided that the saloons were also hotels. By perching ten bedrooms on top of a saloon, the saloon became in law a hotel, entitled to sell liquor seven days in the week; but as the bedrooms so built over the saloon were unsuited by location for the conduct of a legitimate hotel business, the saloon keeper had either to put their cost down to profit and loss or to use them for illegitimate purposes; and it is asserted that eighty per cent. of the saloon keepers preferred to do the latter. How impossible it was to check the violation of the Raines law, whether the saloons were open as simple saloons in direct violation of the law or as hotels in technical compliance with it, was attested by Mr. William T. Jerome, the candidate for district-attorney in New York, who stated that when President Roosevelt was police commissioner of New York he made an effort of the most determined and unflinching kind to force the liquor dealers to observe the law, and the only appreciable effect of his labor was to double the price of protection paid by saloon keepers to the New York police.

That this was the admitted state of affairs was avowed by both parties in the mayoralty campaign of 1901. Both parties, moreover, while alleging or intimating that they would seek the repeal by the legislature of the obnoxious hotel clauses in the Raines law, practically pledged themselves also to a "liberal enforcement" of the remainder of the law requiring all saloons proper to close on Sunday. What a "liberal enforcement" meant was not specifically defined except by Mr. Jerome, who construed it as follows: "Liberal enforcement is rot. Liberal enforcement of a penal statute is non-enforcement of a penal statute." This also was the general construction placed upon the phrase by the average voter; and it was significant of the strength of the sentiment in New York in favor of opening saloons on Sunday, that neither the candidates for the mayoralty nor their subordinates cared to go before the electorate without either tacit or avowed promise of a change in the Sunday liquor laws.

After the election the promises made on behalf of the fusion party for reformatory laws were stated to have been made without authority. There was, however, a singular deadlock between the city and the State, which would have been likely to render nugatory any attempt upon the part of the city to have more liberal Sunday laws passed. The Raines law appeared to have been originally passed from a combination of three motives: (1) To raise an easy revenue for the State of somewhat over \$12,000,000 annually; (2) to satisfy the moral sentiment of the small towns throughout the State; (3) as was alleged, to transfer to some extent at least the interest and allegiance of saloon keepers from New York to Albany. Owing to

these combined reasons the Raines law, or at least that part of it which prohibited the opening of saloons on Sunday, was stated to be so strongly backed by the Republican electorate that it could not be repealed or substantially modified without the defeat of the party. As stated by Mr. John G. Agar in *Municipal Affairs*, if the Republican State government permitted the law to be changed the result would be the overthrow of the Republican party in the fall elections of 1902; while if, on the other hand, the reform administration of New York City enforced the law the result would be the overthrow of reform government in the fall elections of 1903. The majority of the voters of the State would not allow the law to be changed and the majority of the voters of the city would not allow the law to be enforced. It appeared then that the law would not be materially changed in the immediate future, for the State legislators would not presumably care to sacrifice their places for the benefit of the city. Moreover, and except as to the repeal of the hotel clauses in the law, there was much divergence among the friends of reform as to what, if any, alterations in the law should be made. A small party indeed held that no liberalizing of Sunday laws should be made; that Sunday should be kept sacred so far as possible; and that those who persisted in violating the Sabbath should not at least be given the sanction of the government. This party alleged also, from the point of view of expediency, that the greatest part of the population of the city was forced to work six days in the week and on those days had little time to drink; while if the saloons were to be open on Sunday a whole day to drink would be placed at their disposal. Even if there would not be more drinking on Sundays than on other days, these people stated, then it must be supposed that the extent of the liquor traffic was gauged by the number of hours during which liquor was sold, and therefore the vice and depravity already resulting from liquor would be a seventh increased by the opening of saloons on Sunday. To these arguments it was answered that, as everybody knew, practically all the saloons that now cared to be open were open seven days in the week; and that if a law were passed permitting saloons to be open for perhaps twelve hours on Sunday, that law could be enforced, whereas under present conditions the saloons were open anywhere from eighteen to twenty-four hours on Sunday. Public sentiment, it was asserted, would back the enforcement of a partial Sunday law, though it countenanced the open violation of the present law. Again it was asserted that to great numbers of people, largely of foreign extraction living in the crowded tenement districts, the saloon was not a debauching influence as for better people gone astray, but was at once a poor man's club, a restaurant, where he might eat without price when hungry, and a sort of employment agency where news was collected and disseminated of work to be obtained. This type of saloon, it was added, was sustained by the same sort of social force and instinct which had so much to do with the maintenance of churches in the country districts. The people who resorted there had rights of individual freedom and action which should not be denied them, and in lack of any other adequate club furnished them either by private individuals, by church, or by State, they should not be deprived of the only escape they had from foul and dingy tenements. While the arguments along these and similar lines were very extensive before the elections, after the elections the discussion appeared to become much less excited and far more academic and less likely to result in any special or efficient action.

New York's Mandatory Legislation for the Payment of Laborers on City Works.—On February 26, 1901, the New York Court of Appeals handed down an important decision denying the constitutionality of the so-called Prevailing Rate of Wages law of 1897. This law, which technically applied equally to all parts of the State, but actually on account of the superior strength of the labor organizations of New York City, applied almost wholly to New York City, prescribed that all laborers and mechanics upon public works should be paid not less than the prevailing rate for a day's work in the locality where the public work was being conducted. All contracts made by the State or any municipality for the construction of public works were directed under the law to contain a clause binding the contractor to pay this prevailing rate to his workmen, and estopping him if he did not pay that rate from collecting any compensation from the State or municipality, notwithstanding that the work on which he had been engaged had been satisfactorily completed. What constituted a prevailing rate of wages was not stated in the act, but for practical purposes, this prevailing rate was fixed by the various labor unions, and the act was evidently intended to force all municipalities, and especially the City of New York, to pay the union workmen the highest rate which their organizations were enabled to enforce in private work. The importance of the law to New York may be judged from the fact that counsel for both sides admitted that some \$6,000,000 was immediately at stake in the decision of the court; that is to say, \$6,000,000 represented the difference between the sums which New York City had paid to its employees since the enactment of the law and the sums which the city would have to pay if the law were held to be valid. By a decision of five to two, the

court held that the Prevailing Rate of Wages law was unconstitutional, since it deprived both the municipalities and persons contracting with municipalities of the right of freedom of contract. Municipalities, the court held, were entitled to at least all the rights of private individuals in making contracts; and obviously the legislature could not, without contravening that provision of the constitution which holds that no person shall be deprived of property without due process of law, force municipalities to enter into disadvantageous contracts. Furthermore, by the charter of Greater New York, the city was prohibited from entering into indebtedness beyond 10 per cent. of the assessed valuation of its property; but obviously this provision was nullified if the legislature was to have permission to force the city by mandatory legislation to open its purse to private individuals.

Taxation of Corporations in Chicago.—On October 24 the Supreme Court of Illinois handed down an important decision directing the State Board of Equalization to assess the property of corporations at the same proportion of their market value as the property of individuals was assessed. The case arose on the initiative of the Chicago Teachers' Association, who, considering that their insufficient salaries and the inadequate school buildings and appliances were caused by an insufficient tax levy, sought by law to force the State Board of Equalization to tax twenty-three specified public service corporations in Chicago, on the basis not of \$33,000,000 worth of tangible property as heretofore, but according to the fair market value, estimated at \$368,000,000 of their capital stock and franchises. The court stated in its opinion that in assessing the corporations the Board of Equalization had violated every well-established rule for the taxation of property; that it had drawn up new governing rules in order to avoid levying on the stock, and that fraudulent assessment was in other ways clearly established. The court therefore directed the board to assess at once the corporations named in the proceedings, including telephone, telegraph, gas and traction companies, at the fair cash value of their capital stock and franchises, deducting therefrom the value of the tangible property already assessed. While no mention was made by the court of corporations not named in the suit, it was evident that the decision was a sweeping one, affecting equally all corporations in the State, many of which, like those of Chicago, had previously escaped anything more than nominal taxation. Leaving out of consideration, however, both the corporations not specified and also the possibility of collecting back taxes as a result of the decision, it was estimated that some \$2,000,000 annually would be added to the income of Chicago, and perhaps twice that amount to the general school fund.

The "Ripper" Bill in Pennsylvania.—The tendency frequently observed in State governments of late years to govern the affairs of municipalities from the State capital, was pushed to perhaps its furthest extent in a law enacted by the Pennsylvania legislature on February 28, 1901. This law destroyed the existing charters of the cities of Pittsburgh, Allegheny, and Scranton, and created new charters for those cities under which the governor of the State either by himself or through his appointees received plenary power of local and municipal administration. The ostensible purpose of the law was to centralize the government of those cities, giving the mayors much greater powers of appointment and removal of the heads of city departments than they had previously exercised and making them generally much more responsible. Actually, however, the mayors would, under the law, be forced to re-delegate all the powers gained by them to the governor of the State, to whom was given absolute power to appoint or remove the mayors. In accordance with the constitutional provision of Pennsylvania, prohibiting the legislature from enacting special laws, the new municipal law purported to draw up a new schedule of government for all cities of the second class, and made the mayors—henceforth to be called recorders—of these cities elective officers responsible solely to the people for their acts. (See PENNSYLVANIA, paragraph "Ripper" Law.) But by means of a so-called "schedule" appended to the law as passed, practically all power of governing themselves was taken from the citizens of cities of the second class; that is to say, of Scranton, Pittsburgh, and Allegheny; for the schedule provided that within 30 days from the approval of the act, the governor should appoint the city recorders and that they should hold office until the municipal election in 1903. These recorders, notwithstanding the contrary provisions of the act itself, were to be eligible for reelection at that time, and in the meantime the governor might remove them at pleasure. The recorders were authorized to appoint and remove the municipal heads of departments, and the heads of departments in turn were authorized to remove any and all of the officers and employees and persons holding position and employment in their respective departments and to appoint their successors. It would be difficult to imagine a more monarchical form of government than the one thus provided, abolishing as it does, at least till 1903, both civil service and the most elementary rights of the citizens at large.

Nevertheless the matter having been taken to the courts, the Supreme Court of Pennsylvania on May 27 rendered a decision in which four of the seven judges con-

firmed the constitutionality of the law. The majority opinion stated that since the law did not expressly violate the constitution, it could not be set aside merely because it was "unwise, unjust, oppressive, and violative of the natural or political rights of the citizens." In this holding, however, which is in effect that the constitution is to be construed by its letter and not by its fundamental spirit, State courts, as is well known, have held diversely. In Nebraska, for example, where politics are taken very seriously, a Fusionist Supreme Court reaffirmed on June 7, 1900, a decision made in 1898 when the court was Republican, prohibiting a Fusionist governor from appointing fire commissioners to Omaha City. For, as the court said in its first decision, such appointments would act to deprive the people of the city of local government, and this was an inherent right in force when the constitution was framed and of continuing effect even if the constitution did not expressly guarantee it. The issue which may be said to be here clearly joined is one that is often of special interest in matters of municipal rights and government where no specific constitutional clause covers the question. Several State courts have, as in Pennsylvania, declined to go beyond the letter of the law in such matters, stating that they were only called upon to interpret the laws as they actually exist at the time the decision is made. Other courts, on the other hand, have held that if a matter is clearly against public policy and the inherent common-law rights of individuals or communities, it is to be declared illegal unless specifically guaranteed by the laws and the constitution. From these diverse premises as instanced in Pennsylvania and Nebraska, diverse decisions of wide importance have been handed down; the results apparently being largely dependent upon the personality of the judges composing the court.

Taxation of Public Utilities in Cleveland.—The most important development in tax reform during 1901 was the agitation begun at Cleveland by Mayor Tom L. Johnson (*q.v.*) and carried to the State capital in favor of an appraisal of the property and franchises of corporations at their true market value. A pamphlet printed for Mayor Johnson entitled *Taxation in Cuyahoga County* contains the results of his work in Cleveland. He found that public service corporations were paying taxes on very much less than the actual value of their property. Two street railroads in Cleveland, for example, were worth in money \$26,410,000. They were listed for taxes in 1901 at \$1,883,860. The steam railroad property in Cuyahoga County was listed at \$4,569,620, a figure not more than 60 per cent. of the value of the rails, ties and rolling stock, bridges and depots. The land owned by the railroads entirely escaped taxation, although worth over \$12,000,000. "Flat cars are appraised at \$100, which is less than the patent couplers and brakes on the same are worth. Locomotives are appraised on the average at \$2,500. They cost about \$13,000. Passenger coaches are appraised at about \$1,300. They cost about \$6,000." The city board of equalization appointed by the mayor raised the appraisal of the two street railroad companies from \$1,883,860 to \$14,780,500; the appraisal of the two gas companies from \$827,900 to \$4,416,100, and that of the electric light company from \$250,000 to \$1,122,620, or a total addition to the tax duplicate of property which had heretofore escaped taxation of \$17,979,390, which enabled the tax commission to reduce the rate of taxation in the city from 3 per cent. to 2.67 per cent. Mayor Johnson endeavored to induce the county auditors of Ohio to consider evidence tending to show that the property of the steam railroads was grossly undervalued; but the auditors refused to receive the evidence. He then succeeded in presenting the evidence before the State board of equalization, who refused to interfere. The agitation in favor of tax reform was carried into the State election and was made a plank in the Democratic platform. The Republicans, although victorious in the State at large, were compelled to heed the general clamor for a revision of the tax laws, and a number of bills have been introduced at the present session of the assembly, whose object is to separate State from local taxes and thus to lessen the burden on the counties.

The approaching vote of Colorado on the constitutional amendment which will permit each county to adopt its own system of taxation, has brought to light the existence of a hitherto unsuspected strength of the Single Tax Movement. Every single tax club in the United States is expected to send money to Colorado to urge the adoption of the amendment with the expectation that a form of single tax will be adopted by the counties. There are between 200 and 300 of these associations and most of these will contribute to the Colorado campaign. The main provisions of the proposed amendment are as follows: First, giving the General Assembly power to exempt by law any or all personal property and improvements on land from taxation. But land and franchise values must be taxed. Second, permitting the electors of any county in the State to vote once in three years upon the petition of 100 voters to exempt from taxation all property except land and franchise values. The single taxers regard the Colorado contest as an opportunity to bring their propaganda prominently into a State contest. They hope to force the issue in other States if successful in Colorado.

MUNICIPAL LODGING HOUSES. During 1901 a municipal lodging house was opened in Paris as the result of an arrangement between the City Homes Association and the police department. The association has, at a cost of \$5,000, rented a house for one year and furnished it, while the city pays the operating expenses of the house. The lodging house occupies a four-story building and contains single iron beds to accommodate 225 men. Lodgers are required to register and state where they were last employed, with references. The men are given supper and breakfast, but are not allowed to remain at the house during the day. References are looked up as far as possible, and an employment bureau is conducted in connection with the establishment. In England and Scotland municipal lodging houses are much more common than in America. The following statistics for the year 1900 from the *Municipal Journal and Engineer*, relating to the lodging houses in seven of the smaller English cities, give some idea of the scope of this charity across the water:

	Popu- lation.	Number of lodging houses.	When built.	Num- ber of beds.	Income.	Expen- ditures.	Cost.
Manchester.....	550,864	2	1899	363	.....	.....	\$128,390
Salford.....	220,816	1	1894	285	\$10,735	\$14,725	84,400
Southampton.....	106,831	1	1899	186	9,965	11,845	72,500
Huddersfield.....	104,564	1	1880	194	4,896	4,535	35,000
Leith.....	78,509	1	1894	200	6,806	6,685	40,250
Lancaster.....	40,626	2	1896	99	2,550	2,405	3,550
Darwen.....	39,000	1	1898	130	2,485	4,950	39,585

Manchester charges twelve cents per night and seventy-five cents per week for lodging; Salford, twelve cents per night and sixty-eight cents per week; Southampton, twelve cents per night; Leith, ten cents per night; Lancaster, eight cents per night; Darwen, ten cents per night, and sixty-two cents per week.

MURAT, Prince JOACHIM NAPOLEON, French brigadier-general, died in Paris, October 24, 1901. He was born at Bordentown, N. J., July 21, 1834, the son of Prince Napoleon-Charles, and returned to France after the revolution of 1848. Entering the army as a private in 1852 he rose in rank to lieutenant-colonel in 1863. In 1886, upon the passing of the law disqualifying members of ex-regnant families from serving, he was struck off the army lists, but on appeal to the council of state was reinstated and made a brigadier-general on half-pay. General Murat became a member of the Legion of Honor in 1857 and an officer in that body in 1868.

MURPHY, Monsignor EDWARD F., Roman Catholic divine, died at Halifax, Canada, November 4, 1901. He was born in County Cork, Ireland, September 1, 1844, and was educated at Dublin and at St. Sulpice College, Montreal. Ordained to the priesthood in 1867, he became a professor in St. Mary's College, Halifax, and later was chosen president. After serving as secretary to Archbishops Hannan and O'Brien he became, on the death of Monsignor Power, in 1887, rector of St. Mary's Cathedral, Halifax, and Monsignor Power's successor. He was created a D.D. by the Pope in 1892.

MUSIC IN 1901. The Fourth Symphony of Mahler met with moderate success at its first performance at Munich, November 25, under the composer's baton. In the last movement it has a soprano solo. Weingartner's second symphony, provided with an elaborate programme, was given at Chicago by the Thomas orchestra, in November. It clings to the classical ideals in form and spirit, but whether it has the vitality of those models is a matter easy to guess for those who have heard his *Islands of the Blest* and his other productions in the same line. Elgar's concert-overture *Cockayne* (In London Town) was conducted by the composer at the concert of the London Philharmonic Society of June 20, and was later given in the United States by the Symphony Orchestras of Boston and of Chicago. It is fresh, vigorous, and full of imagination and color, quite good as absolute music, though failing to describe London life, even with the help of a minute programme. Henry K. Hadley's second symphony in F Minor, *The Four Seasons*, of which two movements had been heard before, was given in its entirety for the first time by the New York Philharmonic Society on December 20. It received the prizes offered by the Paderewski Fund and by the New England Conservatory of Music, and bids for a place of honor among the more pretentious productions of the too limited number of American composers. It has a programme, and the order of the movements is Winter, Spring, Summer, and Autumn. It has happy passages and seizes well enough the general mood underlying each season, but it requires a very elastic imagination to range the music of each section under the proper label. Victor Herbert's symphonic poem, *Hero and Leander*, proved a very strong work. Coleridge-Taylor's *Idyll* for orchestra had its initial performance during the Gloucester Festival

of England. In chamber music, a String Quartet by Dohnanyi was well received at its first performance by the Hubay Quartet, in Budapest, and a piano trio by Ernst Heuser, a young composer of Cologne, met with success at the Leipzig Gewandhaus on November 30. The vocal novelties in concert music were chiefly confined to the English-speaking countries, where they are written to order for special festivals. Among these, George W. Chadwick's "lyric drama," *Judith*, seems to have been by far the noblest work. As an attempt to combine opera and oratorio it naturally comes dangerously near the theatrical, though very effective on the concert platform. The composer labored under the difficulty of a libretto (taken from the story in the Apocrypha), which lacks poetic sentiment and historical atmosphere, and accentuates the repulsive element of the story. It was pronounced "a good guide-post for twentieth century oratorio." H. Brewer's sacred cantata *Emmaus*, Coleridge-Taylor's setting for orchestra, chorus, and soprano and baritone solos, of *The Blind Girl from Castél-Cuillé* (Longfellow's version from the Gascon of Jasmin), and Charles Wood's setting of Whitman's *Dirge for Two Veterans* were the most important novelties of the English festivals. The vogue of *The Persian Garden* induced Liza Lehman to write another song cycle, *The Daisy Chain*, first heard at a National Sunday League Concert and then throughout England. However, several prominent American critics handed down a decision of shallowness and vapidly against it. In opera no new work was brought out that seemed to threaten the unceasing popularity of Charpentier's *Louise*. Richard Strauss produced a one-act opera, *Feuersnoth* (The Fire Famine), at the Royal Theatre, Dresden, on November 21. Its subject, taken from a Dutch legend, recites the miseries of the populace of a town deprived of light by a magician in revenge for the humiliating prank of a town girl. It is autobiographical and derides the Munich authorities, who did not recognize the "fire" of Strauss as well as of Wagner. The music was absurdly abstruse for the setting of so light a story. Paderewski's long-beparaphrased *Manru* in three acts, was first performed at Dresden on May 29, where it met with a friendly but not over-enthusiastic reception. The libretto contains some uncommonly beautiful passages adapted for lyric outbursts of the highest order; but its general composition is theatrically weak. Manru, a gypsy, marries a Slavonic peasant girl, Ulana, who is thereupon repudiated by her mother and her people. Manru's nomadic nature soon wearies of settled life, and his restlessness culminates in his return to the band of gypsies when he hears a gypsy playing on the violin. The chorus and orchestra are made to bear the burden of the play. The vocal parts are of comparatively slight importance. The passages that have any real life and movement about them are those strongly reminiscent of *Siegfried*, *Walküre*, *Tristan und Isolde*, *Carmen*, etc. The most effective music in the whole opera is the violin music of the gypsy in the second act. But this, too, is only a direct appropriation from some itinerant musician, and it is repeated to the end of the opera. The peasant dances, purporting to be Slavic in character, will hardly be recognized as such by anybody conversant with Slavic folk-music and dances. An orchestral prelude to the third act, depicting a sultry summer night with the moon struggling through the clouds, is entirely too long drawn out, lasting between twenty and twenty-five minutes. It contains the regulation chromatic runs, several octaves up and down, with the piccolos and flutes flaring above and *glissando* effects à la Hungarian Rhapsodies of Liszt scattered all over, but *Der Fliegende Holländer*, *Walküre*, *Otello*, and *Rigoletto* exhibited all these effects, and more powerfully, too, before the composer adopted them for *Manru*. Mascagni's *Le Maschere*, "lyric comedy in three acts and a prologue," was produced on January 17 at the Teatro Costanzi, at Rome, with fair success. It was sung simultaneously in Venice, Turin, Genoa, Verona, and Milan; and besides, a production at Naples was to have taken place on the same evening. The composer aimed at taking up *opera buffa* where it was left off by Paisiello and Cimarosa, and reduced the orchestra to fifty pieces. The critics of cities other than the capital found the music labored, the orchestration full of mannerisms, the melodies lacking in charm and sadly reechoing the works of Mozart, Cimarosa, Rossini, Liszt, Puccini and of the composer himself. Siegfried Wagner's *Herzog Wildfang* (Prince Madcap) was put on the stage at the Munich Court Opera on March 23, and at the Leipzig City Theatre on March 27, and was greeted with enthusiasm by the limited coterie of worshippers of the Wagner family. The general drift of opinion was that it was hardly an improvement on his *Bärenhäuter*, which was bad enough. France was more fortunate in the new works of its two foremost composers. *Les Barbares* (the Cimbri and Teutons of the Roman invasion), a lyric tragedy in three acts and a prologue, by Saint-Saëns, words by Sardou and Ghéusi, won an unqualified success which has continued since its production at the Paris Opéra on October 23, and a similar success was accorded Massenet's *Grisélidis*, a fairy opera in a prologue and three acts, text by Silvestre and Moran, performed at the Opéra Comique on November 20. Of the Italian output, a permanent place on the boards seems to be destined for *Chopin*, an opera in four acts by a young composer, Giaconio Orefice, which won

a distinct success at the Teatro Lirico, Milan, in December. The music is based on themes from Chopin's works. In Felipe Pedrell's dramatic trilogy, *The Pyrenees*, the first attempt has been made to write operatic music on a patriotic subject in a strictly national style. The work was scheduled for production at the Liceo Theatre, Barcelona, at the end of December. Among the most successful operettas of the year, the following may be mentioned: *The Messenger Boy*, Strauss's *Vienna Life*, and *Florodora*, which continued its successful run from the previous year.

Deaths, Anniversaries, and Jubilees.—The year brought severe loss to the musical ranks. The last of the musical giants of the nineteenth century, Verdi (*q.v.*), that "grand old man of Italy," died January 27. Audran (*q.v.*), the author of world-known comic operas, died on August 19. In Joseph Rheinberger (died November 25) the world lost one of the greatest teachers of counterpoint and composition as well as a great composer for the organ. Dr. Friedrich Chrysander (born July 8, 1826, died at Bergedorf near Hamburg, September 3) was the authority on Handel, whose works he edited for the "Händelgesellschaft." His biography of Handel is the standard work. Col. J. H. Mapleson (*q.v.*), the knight-errant impresario, died in London, November 14, and hardly any of the great singers whom he had guided in their careers took notice of the funeral. Other deaths of the year were the concert-singer, Mrs. Henschel (*q.v.*), November 5, in London, and the tenor, Emil Goetze, on September 29. The necrology list must further be extended by the addition of the names of D'Oyly Carte, Stainer, Archer, and Hoskins (*qq.v.*). The one hundredth anniversary of the death of Italy's elegiac music-poet of the stage, Bellini, was celebrated in Italy and several other countries, on November 1. A chapel was dedicated to the memory of Rubinstein at St. Petersburg on November 21, the anniversary of his death. A beautiful life-size bust of the composer adorns its interior. A statue of Lortzing was erected in his native town, Pyrmont. Part I. of the first volume of Tchaikowsky's biography by his brother Modest, was published in October by Jurgenson (Moscow and Leipzig) in Russian, and in German under the title *Das Leben Peter Iljitsch Tschaiakowsky*. On July 18, Mme. Viardot Garcia celebrated her eightieth birthday; the famous professor of theory and composition, Solomon Jadassohn, his seventieth on August 13, and Julius Stockhausen, the great singing-teacher, his seventy-fifth on July 22. The new conservatory building of Moscow was dedicated with great pomp in April. On the first night the Imperial Russian Musical Society gave there its tenth symphony concert, when the *Ninth Symphony* of Beethoven was performed. The organ, which cost some \$10,000, is one of the best in the world, and the acoustics of the auditorium are absolutely perfect. The opening of the new Prince Regent's Theatre of Munich is mentioned elsewhere.

Revivals and Local Novelties.—The death of Verdi gave a special impetus to public interest in his works, and many of his earlier operas were produced in various places; but the most appropriate event was naturally the performance of his wonderful *Mansoni Requiem*, both in Europe and the United States. In New York it was given on three consecutive Sundays amid the greatest enthusiasm of an audience that filled the opera house to overflowing. Similarly there was a revival of Sullivan's comic operas and choral works in England. In London the Purcell Operatic Society gave in March, Purcell's *Dido and Æneas* and the "Masque of Love" from *Diocletian*, and on June 15, J. S. Shedlock conducted the long-lost *The Fairy Queen*, which he had recently recovered. Glück's *Iphigenia in Tauris*, revised by Richard Strauss, was enthusiastically received at the Schwerin Court Theatre in December. An overture by Mozart, probably written in 1778 and discovered in the Paris Conservatoire library, was performed at the first concert of the Conservatoire season, under Georges Marty, and a Mozart cycle, similar to former years, was successfully given at the Munich Residenz Theater, the orchestra for *Così Fan Tutte* numbering only thirty musicians, as originally intended by Mozart. A cycle of Wagner operas (from *Rienzi* chronologically), given for the first time at Graz, achieved a brilliant success, under Weissleder as conductor. It included the uncut versions of the *Tetralogy*, *Meistersinger*, and *Tristan und Isolde*. The last work had its first performances at the Budapest Royal Opera on November 28, with Countess Vasquez as Isolde, and—*mirabile dictu*, at Buenos Ayres, late in the fall, where a German critic of note pronounced Grani, the Italian tenor impersonating Tristan, in every way superior to Vogl in his prime. In England the Carl Rosa Opera Company gave a creditable first performance of *Siegfried* in English, and the Moody-Manners company was equally successful with *L'Etoile du Nord*. Bach's imposing *Christmas Oratorio* was sung for the first time in its entirety in the United States by the Moravian Church of Bethlehem, Pa.

Festivals.—Of the year's musical festivals in England, the Leeds Triennial of eight concerts took place on October 9-12, Villiers Stanford occupying the place of director left vacant through Sir Arthur Sullivan's death. Its chief object was a "commemoration of nineteenth century music." Among the thirty-three masters represented, twelve were British (Parry, Sterndale-Bennett, Cowen, Mackenzie, C. Wood,

Goring Thomas, Villiers Stanford, Edward German, Elgar, Sullivan, Pearsall, and Coleridge-Taylor), ten German, five French, three Italian, and three Slavic. Besides, works of the great German masters of the eighteenth century were performed. The 178th meeting of the Three Choirs at Gloucester took place September 8-13; as many as eight novelties by native composers found a hearing. The chorus numbered 263, A. H. Brewer conducted, and A. Burnett was the concert-master. The artists engaged were Albani, Sobrino, Ella Russell, Hilda Wilson, Mabel Foster, Ada Crossley, Ben Davies, W. Green, Andrew Black, Lune Wilson, and Plunkett Green. The net balance of £1,763 exceeded by £157 that of the preceding festival. The six concerts of the London Musical Festival (April 20-May 4) were given at Queen's Hall by Robert Newman. The orchestra numbered 110 musicians, and the conductors were Edouard Colonne (first concert), Ysayé (second concert), Saint-Saëns and Ysayé (third concert), Felix Weingartner (fourth concert), and Wood for the last two. The Festival enlisted the services of such well-known artists as Lady Hallé, Joachim, Becker, Busoni, and Bauer, and proved an enormous success both artistically and financially. In the United States two important festivals occurred during the year. The Forty-fourth (annual) Worcester, Mass., Musical Festival was conducted by Chadwick, on September 23-27, including, in all, seven concerts. There was a chorus of 400 voices and an orchestra of 65 musicians from the Boston Symphony Orchestra, with Kneisel as assistant conductor. In all, some 30 works, including two symphonies and a dozen or so larger orchestral pieces, were performed. César Franck's *Les Béatitudes* was the *pièce de résistance*, and Chadwick's *Judith*, spoken of in another place, was the novelty. The attendance was considerably below previous years. The Bach Festival, on May 23-25, of the Moravian Church, of Bethlehem, Pa., was even more imposing than that of 1900. Bethlehem is becoming a sort of Baireuth for Bach, even the Lutheran hymn intoned by four trombonists from the bell tower, to announce the beginning of the performance, is copied from the fanfares of Baireuth; but the genuine devotional spirit of the Moravians is a different thing from the Brahmanism of the Bavarian town. The works in order of performance were: *The Christmas Oratorio*, *St. Matthew's Passion*, and the *Mass in B minor*. Frederick Wolle, the organist of the church, conducted, and did wonders with the choir of a hundred voices; but the orchestra of fifty, also of native talent, was the only serious drawback to the festival. In Europe, a Beethoven Festival was held at Eisenach, Saxony, on October 5-7, with a chorus of 134 of the local *musikverein*, and an orchestra of seventy-four. The Ninth Symphony attracted most interest. The Salzburg Festival, August 5-9, embraced two orchestral concerts, one of chamber music, and a performance of *Don Giovanni*. A splendid array of artists, including Lehmann, Wedekind, Edyth Walker, Sauer, and Petschnikoff among them, made it a memorable affair. Hellmesberger, of Vienna, conducted. The Seventy-eighth *Niederrhenisches* Festival occurred on May 26-28, at Cologne.

Baireuth and Munich.—The twenty-fifth anniversary of the first Wagner Festival was celebrated on July 21, and on July 22 the year's Festival began, ending on August 20. The works performed were: *Der Fliegende Holländer*, five times (July 22, August 1, 4, 12, 19), *Parsifal*, seven times (July 23, 31, August 5, 7, 8, 11, 20), and the *Tetralogy* twice (July 25-28, August 14-17). The conductors were Richter, Mottl, Muck, and Siegfried Wagner. Among the artists engaged, Gulbranson, Schumann-Heink, Krauss, Schmedes, Burgstaller, Van Rooy, Bertram, Blass, and Fredericks were those of note; the rest were of the poorest variety. The orchestra was much inferior to its predecessors. The conviction has taken deep root that, all protests to the contrary notwithstanding, the festivals have degenerated into a money-making scheme for the "Widow of Wahnfried," and much adverse comment has resulted. All the ideals of the sage of Baireuth are shattered in the stubborn efforts of Cosima Wagner to drag Siegfried to a place on the pedestal by the side of his father. In the same category belongs the attempt to obtain a continuation of the *Parsifal* copyright, which is to expire in 1913, and thus to insure an income to Baireuth after that date. Naturally a great deal of animosity was aroused in the Wagner heirs and their close friends when the new Prince Regent's Theatre was opened at Munich on August 20. It has only 1,106 seats against 1,340 of the Baireuth Theatre, of which it is a close and improved copy in every respect. The few defects noticed, especially in the acoustics, can be easily mended according to expert authorities. There were six performances of *Die Meistersinger*, five of *Tristan und Isolde*, five of *Tannhäuser*, and four of *Lohengrin*. The artists were Ternina, Nordica, Fleischer-Edel, Olive Fremstad, Heinrich Knoté, Anthes, Gerhäuser, Reiss, Klopfer, Fuchs, and Geis, and some performances, notably those of *Die Meistersinger*, were beyond cavi.

THE UNITED STATES.

Artists.—As in previous years, the United States attracted many foreign artists. Of the pianists, Josef Hofmann was by far the greatest. A temperament brimming

with animal health, fingers and wrists made harder than steel by constant outdoor exercise and all kinds of sport, a splendid mental equipment acquired by reading on broad lines in many directions, a dynamic command over the keyboard from a thundering fortissimo to an elf-like pianissimo—these are the qualities that place him among the best pianists of modern times. Harold Bauer emphasized the fact that he is a well-endowed pianist, fully up to the modern requirements of technique and interpretation, but more interesting to the connoisseur than attractive for the general public. Respect, almost reverence, for the written notes and the complete submersion of the artist's own individuality in the act of interpretation are rare characteristics, but not quite appealing in these days of the glorification of individuality. The Italian, Toselli, proved a lad of many crudities, whose public appearance was decidedly premature, in spite of the praise of his illustrious teacher, Sgambati. Josef Slivinski, first brought over a decade ago as a homœopathic remedy to the Paderewski craze, won little notice owing chiefly to the low grade of the instruments which he employed at his concerts. A hard, metallic sound with a pronounced banjo-like twang accompanying it, with legato effects as clumsy as those on the plucked spinets of old, could hardly have been turned to any better account by no matter how great an artist. The Dutch artist, Zeldenrust, played with a rush, sometimes blurring the musical outline of a piece beyond recognition, mostly playing loud and fast, though in spots beautifully and with a keen appreciation of the emotional as well as intellectual significance of the work performed—in a word an artist, *not* to be placed in the narrow circle of the Olympians. Mme. Bloomfield-Zeisler, a bundle of nerves and muscle, gave genuine pleasure by her wonderfully emotional, though often uneven playing, her singing tone, her brilliant execution, and her deep insight into the works of the romantic composers.

Among violinists Kubelik (*q.v.*) had the most sensational reception. Whether in his "recitals" or at other concerts, he was applauded by the populace as if he were the only prophet of the violin; every nook and corner of the auditorium was always crowded, the house usually being sold out many days in advance of the performance. His intonation was often quite poor, his tone powerful, though somewhat coarse on the lower strings, and thin in the tones most characteristic of the violin. He never lulled, caressed, or stirred. But when, at his best, he let his spider-like fingers perform bewildering feats of double stopping in harmonics, combined with trills and staccatos, all of marvelous precision and purity of intonation, his hearers would go into frenzies of enthusiasm. His playing of the Paganini concerto was his best achievement. Bach's aria, Beethoven's concerto, and Wieniawski's *Souvenir de Moscow* were little more than botchwork. Fritz Kreisler displayed a good, though not always impeccable technique, a musicianly temperament, and a small tone singularly dull in quality. In Gregorowitsch, on the other hand, the public renewed its acquaintance with an artist of the very first rank. Not dazzling in any respect, his playing is luminous, of singing quality, and so suffused with the right kind of emotion as to lay hold on his audience from the first notes. Gérardy was the satisfying artist whom the public has learned to know in previous seasons.

Among the vocalists, Mme. Sembrich brought over an opera troupe of her own with which she went on tour through the South and West. While in San Francisco early in the spring, she suddenly lost her voice and had to cancel her engagement. In the autumn she returned with the Grau Opera Company, but, as had been noticed in the two preceding seasons, her voice is a mere shadow of its former self. Lilli Lehman, the assertion of her admirers to the contrary notwithstanding, has also lost much of her former power. Esther Palisser returned to the field of her former successes, a useful artist with an acceptable voice and method. Lillian Blauvelt displayed a voice "pushed" to greater volume at the expense of its former quality and of more vigorous expression in lieu of former finish. Gregory Hast, an English singer, ingratiated himself with people fond of English sentimental ballads. He displayed a pretty tenor voice, well suited for that kind of music, but failed in serious *lieder* or in other more pretentious pieces. In the autumn Nordica began a concert tour through many of the large cities of the country. George Hamlin, a Chicago singer with a beautiful tenor voice, delighted New York audiences with recitals of Strauss songs towards the end of the year. An event of great importance for American vocal students was the arrival of the famous Italian professor of singing and composer, Arturo Buzzi-Peccia, who made his residence in New York. He brought the highest indorsements from Verdi, Boito, Mancinelli, Puccini, Leoncavallo, Tosti, and such great singers as Masini, Tamagno, Edouard de Reszke, Sembrich, Marconi, and Campanari.

Musical Organizations.—A feature deserving special notice developed during 1901. The home orchestras seemed to be vieing with one another in the production of unfamiliar works, just as they had erred previously in the opposite direction. Of the novelties thus brought out by the Philharmonic Society, Hausegger's *Barbarossa* overture and Max Schilling's symphonic prologue to *Œdipus King* displayed little

more than mastery in the handling of a modern orchestra; the *Four Seasons* of Hadley has been discussed in another section. As far as the performances go, the Boston Symphony Orchestra still held the lead as an almost ideal body, the New York Philharmonic still showed the lack of rehearsals requisite for a good ensemble, and the imperative need of some new blood in its ranks, the Pittsburgh orchestra gave more promise than actual achievement, while Frank Damrosch with symphony concerts for young people, of which the explanatory remarks are not the least important feature, continued to plant musical seeds in the souls of susceptible youth. F. H. Arens gave a series of concerts at prices from 10 to 50 cents, at Cooper Union, New York, to spread love for good music among working people. In Chicago, Theodore Thomas continued at the head of that city's orchestra, and a visit in March from the Leipzig Philharmonic Orchestra, under the vigorous baton of Hans Winderstein, was welcome only in part; some Strauss waltzes and the lesser battle-horses of the concert stage, such as Tschaikowsky's *Marche Slave* were played beautifully. But in symphonies and larger overtures, the interpretation was provincial, the quality of tone poor, and the dynamic effects insufficient. After a brief career, the organization broke up, and most of the players returned to Germany, the others obtaining engagements in the United States. During the summer, the Kaltenborn Orchestra, in New York, discoursed nightly amid the popping of bottle corks, the explosion of matches, and jabbering of young pleasure-seekers. The leader was not more than a time-beater; but the experience of the musicians—out of a job in the summer—made some pieces and symphonies on Tuesdays almost endurable. But the most interesting, in many ways, were the concerts of antique music, given by Sam Franko, dubbed by some extravagant admirers as a "musical Schliemann." His short programmes were made up of the now unheard works of the masters of the seventeenth and eighteenth centuries. An efficient orchestra of some thirty-odd pieces (mostly musicians of no particular individual distinction) under the hand of a leader in love with the works performed, in a small auditorium (Lyceum Theatre) exactly as they were meant to be by their composers—and there you had the *cadre*, on which that wizard of orchestral effects, Berlioz, lays so much stress. The Musical Art Society continued to lead the singing organizations in its lofty aims and choice of works to be rendered, in the splendid quality and balance of tone, in finesse and well-nigh faultless execution. The Oratorio Society made its customary inroads into the realms of the devotional repertoire, and the People's Choral Union strengthened further the solid reputation it had acquired as a mighty choir, in all ways the peer of any body of professional performers. In the line of chamber music, besides the unrivaled Kneisel Quartet of Boston, several other similar organizations like the Max Bendix String Quartet, the Randegger Quartet, and the newly-formed Mendelssohn Trio Club, all made music for the delectation of the public and all seemed to be thriving.

Opera.—Opera commanded the greatest share of affection of the public, and as usual the "play was not the thing." The doings of the singers were of greater account than the works performed. Jean de Reszke at first kept up bravely, though singing out of tune, which he had done never before, but a sudden cold put him out of the race. His performances thereafter were unworthy of him. Saléza's vices of singing were further accentuated, his singing in *Salammbô* being in perfect keeping with the part of the savage Matho whom he impersonated. Van Dyck was impressive dramatically and sang better than before, and Dippel, if anything, climbed down the ladder, and so Cremonini, with a voice much impaired in quantity and quality since his last visit, was the only tenor whose singing was gratifying *per se*. Edouard de Reszke labored under the disadvantages of an inveterate cold, and did not give the pleasure of former years. Among the women, Melba was the same crystalline-voiced singer of dazzling virtuosity and scant emotional eloquence, though as the unfortunate Mimi in *La Bohème* of Puccini, she was more than merely convincing. In Bréval the New Yorkers made the acquaintance of a pictorially ideal queen of classic tragedy, commanding, magnificent, though monotonous in pose and gesture; tall and lithe, with a voice of extraordinary brilliancy, but with a faulty method. She made the best impression as Chimène in *Le Cid*, but did not live up to it in *L'Africaine*, *Les Huguenots*, and *Salammbô*. Sybil Sanderson came in the fall and was severely criticised in her native San Francisco. She left for Paris after a solitary appearance in New York as Juliet; her voice, always wiry and puny, had lost much of its volume and quality, and had taken on a most annoying tremolo. Calvé fell ill during the company's engagement in the West in the autumn, and remained away for many weeks. Of the works performed, the Wagner Cycles did not draw as before, and the last cycle hardly paid the manager.

The operas given during the year were as follows: *Faust* (8 times), *Lohengrin* (6 times), *Roméo et Juliette*, *Die Walküre*, *Tristan und Isolde*, *Cavalleria Rusticana* (5 times each), *Les Huguenots*, *Tosca* (4 times each), *Die Meistersinger*, *Götterdämmerung*, *Tannhäuser*, *La Bohème*, *Le Cid*, *Salammbô*, *Lucia di Lamermoor* (3

times each), *Das Rheingold*, *Siegfried*, *Der Fliegende Holländer*, *Don Giovanni*, *Mefistofele*, *Carmen*, *Rigoletto*, *Aida* (twice each), and one performance each of *Trovatore*, *Traviata*, *Pagliacci*, and *Don Pasquale*. In addition, 118 performances were given by the company on tour.

Castle Square Opera Company.—After the unsuccessful attempt of 1900 to acclimatize opera in English at the Metropolitan Opera House, Mr. Savage returned to New York for an engagement of six weeks (September 16-October 26) at the Broadway Theatre. The eight performances a week were devoted to four performances each of two different works, *Pagliacci* and *Cavalleria Rusticana* going as one performance. In all, the following thirteen different operas were produced: *Aida*, *La Bohème*, *Bohemian Girl*, *Carmen*, *Cavalleria*, *Faust*, *La Gioconda*, *Lohengrin*, *Märtha*, *Mikado*, *Pagliacci*, *Tannhäuser*, and *Trovatore*. The prices ranged from 25 cents to \$1, with lower rates at the mid-week matinees. With some beautiful voices, an efficient orchestra of thirty pieces, an excellent conductor, and careful attention to stage business, some performances were quite admirable—e. g., *Aida*, *Bohemian Girl*. Of the singers, the tenor Reginald Roberts made the most favorable impression. With a thoroughly artistic temperament, he unites a beautiful lyric voice, which further study will easily bring to higher planes of activity. The theatre was always crowded.

In England, the Philharmonic Society of London, under E. Cowen's leadership, passed through its eighty-ninth season of seven concerts of music of the loftiest character. Dr. Hans Richter gave his orchestral concerts on May 20, and June 3 and 10, at St. James's Hall, and again delighted his admirers by his interpretations of the works of the great tonal masters. The Saturday afternoon popular concerts were continued at St. James's Hall (the most important production was the Choral Symphony, given with the assistance of the Wolverhampton Festival Choral Society), and the promenade concerts of Robert Newman, under Henry J. Wood, took place at Queen's Hall, between August 24 and late in November. Many novelties were performed, the most notable being Tschaiakowsky's *Swan Lake* (ballet), excerpts from Siegfried Wagner's opera *Hersog Wludfang* (Prince Madcap), Balakireff's Symphony in C, Alfvén's 2d Symphony (in D), Glazunoff's *The Seasons* (ballet), and Weingartner's 2d Symphony (in E flat).

Among the foreign artists that visited the United Kingdom, were the violinists, Joachim, who, with Sauret, Halir, and Lady Hallé, alternately led the new Quartet Party, Sarasate, Ysayé, Kubelik, Lady Hallé, and Jaroslav Kocián, a new candidate for the laurels of Kubelik. A fellow-pupil (born on February 22, 1884) of the latter under Sevcik at the Prague Conservatorium, and his equal in mere technique, he surpasses him in genuine musical feeling. His playing of Beethoven's sonata in C minor (for pianoforte and violin) and Bach's *Chaconne*, was unanimously set down as a marvelous achievement, second to none other heard in London in many a year. Among the pianists, Paderewski, Saint-Saëns, Busoni, and Harold Bauer were the most important names, and the cellist, Hugo Becker, too, achieved a great success. The opera season was under the direction of André Messager, who succeeded Maurice Grau. The singers engaged were: Melba, Calvé, Ternina, Eames, Paquot, Bréval, Suzanne Adams, Gądski, Strakosch, Brema, and Frankel Claus; Tamagno, de Marchi, Van Dyck, Saléza, John Coates, Anselmi, Scotti, Bispham, Van Rooy, Forchhammer, Knotte, and Plançon. Mancinelli and Flon conducted the Italian and French operas, while Otto Lohse had charge of the German works. The artists that especially distinguished themselves were: Tamagno in *Otello*, *Aida*, and *Messaline*; de Marchi in *Aida* and *Huguenots*; Scotti in *Otello*; Melba in *Faust*, *La Bohème*, and *Lucia*; Calvé in *Carmen*, *Messaline*, and *Faust*, Ternina in the Wagnerian repertoire, and Paquot in *Le Roi d'Ys*. In all, 67 performances of 20 different operas were given in 11 weeks and one day. Villiers Stanford's *Much Ado About Nothing* was the absolute novelty of the season. Performed on May 30, in English, by English artists (with one exception), it made an excellent impression, and the critics found in the music a worthy setting of the subject. Lalo's *Le Roi d'Ys* was performed on June 17, and proved a strong and attractive work. *Otello* was the most important and welcome revival. The Wagner performances fell, in number, far below previous years, the promised magnificent production of the *Tetralogy*, on which a great deal had been expended, having been postponed owing to the Wagner performances on the Continent—at Baireuth and the new Prince Regent's Theatre in Munich.

MUSICK, JOHN ROY, American author and politician, died at Omaha, Neb., April 14, 1901. He was born in St. Louis, Mo., February 28, 1849, served for ten years as United States commissioner at Kirksville, Mo., and was a member of the Republican State Central Committee for the State of Missouri. He wrote a twelve-volume history of the United States in novel form, and published other stories, written principally for boys, among which were *Brother Against Brother*, *Hawaii*, *Our New Possessions*, *Cuba Libre*, and *Calamity Row*.

NATAL, a South African colony of Great Britain, bounded by Cape Colony, Basutoland, the Orange River Colony, the Transvaal, and the Indian Ocean, has an area (including the province of Zululand, annexed December 31, 1897) of 35,019 square miles; its population was officially stated, in 1898, as 902,365, and estimated in 1900 at 929,970. There were nearly 65,000 Europeans, about 70,000 Indian coolies, and 795,000 Kaffirs. In 1900, Durban, the only port and largest town, had 48,410 inhabitants, and Pietermaritzburg, the capital, 28,500. Instruction is provided by government and private schools for Europeans, Indians, and natives, separately. Of the total number of white children, over 96 per cent. receive instruction. In 1899 the attendance at the Kaffir schools, of which there were 188, was 10,725, and of the Indian schools, of which there were 35, was 3,561.

Government and Finance.—The executive power of the government is vested in a governor and a board of ministers; the legislative power, in a council of twelve, nominated by the governor, and a popular assembly of 39 members. The governor of the colony in 1901 was Sir Henry Edward MacCallum. Defense is provided for by a mounted police force consisting of 660 Europeans, a volunteer body of 1,551 white men, and a naval brigade of 90 men. Revenue is derived chiefly from the railways, customs, and native hut tax. The principal items of expenditure are the railways and public works. In 1900 the revenue amounted to £1,886,710 and the expenditures to £1,990,522. The public debt on December 31, 1900, was £9,019,143.

Industries, Commerce, etc.—The leading agricultural product is sugar. Considerable quantities of coffee, indigo, tobacco, rice, and tea are raised in the fertile coast region, while in the less favorable soil of the interior, large crops of corn, wheat, and oats are grown. The most important industries, however, are grazing and sheep-farming. In 1898 there were mined 387,811 tons of coal; the output declined in 1899 and the early part of 1900, owing to the Boer War, but in the last seven months of the latter year the production amounted to 241,330 tons. The bulk of the external trade is carried on with Great Britain, and a large part of the remainder with the British possessions in South Africa and Australia. The principal articles of import are clothing and apparel, food-stuffs, steel and iron manufactures, machinery, and leather goods. The leading exports are wool, gold, coal, sugar, hides and skins, and angora hair. In 1899 the total imports amounted to £5,359,259, and the exports to £1,325,197. In 1900 the imports increased to £5,911,518, a gain of more than 10 per cent., but the exports fell off to £1,134,172, a loss of nearly 15 per cent. Of the imports into Natal, the United States contributed £667,799 in 1899, and £661,841 in 1900, about 65 per cent. of the total imports from non-British countries. In 1901 there were 612 miles of railway in operation, all worked by the government. During the year there was a line under construction from the Tugela to Hlabisa, 100 miles distant, and another from the coal-fields to the Buffalo River.

History.—In 1901 the South African War was not carried into Natal. In the middle of September, however, the concentration of Boer forces in the northern border seemed to threaten an invasion of the colony, and the volunteers were called out; but their services were not needed, as the Boers were driven from their position by the British troops in the Transvaal. During the year there was considerable discussion concerning the formation of a customs union to include all the British South African possessions; this was regarded as only a step towards the establishment of a single great South African state, in which the inhabitants of Natal, mindful of their loyalty during the war, hoped to play an influential part. The legislative elections were contested on the tariff issue. The planters in general favored the continuance of existing relations with Cape Colony, while the commercial population favored the scheme of a customs union. In July, 1901, the legislative assembly entered upon a more than usually extensive programme for public works, by voting £3,000,000 for the improvement of the harbor of Durban and the construction of railway and telegraph lines. See TRANSVAAL.

NATION, MRS. CARRIE D., a native of Medicine Lodge, Kan., came prominently into public notice during 1901 by her spectacular attempts to solve the liquor problem in the nominally prohibition State of Kansas, and performed her experiments chiefly at Wichita. Her method was to enter saloons and smash all the glassware in sight with the hatchet she always carried, and to empty into the street all the spirits obtainable. In spite of numerous arrests for disturbing the peace, and general ridicule, she maintained her course steadfastly, visiting many cities outside of Kansas, as well, lecturing and making tours of inspection in order to help the local temperance organizations. While no doubt has ever been raised as to the sincerity of Mrs. Nation's purpose, her startling method has provoked much adverse criticism. In the larger cities visited by her, notably Chicago and New York, she was received with genial indifference by the public at large, but the great notoriety of her achievements attracted large audiences to her lectures. The basis of her crusade is that her first husband's death was caused by liquor, which she holds gives her the legal right to exterminate the saloon.

NATIONAL BANKS. Owing partly to the national banking act of March 14, 1900, permitting national banks to be organized with a capital of less than \$50,000 and as small as \$25,000, and owing partly to the continuance of prosperity throughout the country, both the number and the resources of national banks increased largely during the years 1900 and 1901. From March 14, 1900, to October 31, 1901, 503 banks were organized under authority of the new banking law with a capital of less than \$50,000, and with an aggregate capital of \$13,194,500, and during the same period the total number of new banks organized, including those mentioned above, was 742 with an aggregate capital of \$39,029,500.

Geographically, the largest number of banks chartered during this period were organized in the Middle States. These numbered 230, with an aggregate capital of \$12,305,000. In the Southern States, 179 banks were authorized, with a capital of \$9,465,500, of which 115 banks were authorized with a capital of less than \$50,000. In the Western States, 157 banks were established, of which 134 were of the smaller class. In the Pacific States, including Hawaii, 14 banks of the smaller class were organized, with an aggregate capital of \$360,000, and 12 of the larger class with \$1,800,000 aggregate capital. In the New England States only 12 new banks were organized—three each in New Hampshire, Massachusetts, and Connecticut, two in Maine, and one in Rhode Island. Texas led all the States in the number of new banks, having organized 93; Pennsylvania followed with 80 banks; Iowa was third, with 53 banks; Ohio, fourth, with 44 banks, and then came in order Illinois, 40 banks; Oklahoma, 39 banks; Indian Territory, 37 banks; Minnesota, 29 banks; New York, 28 banks; Indiana, 27 banks; and Nebraska and Kansas, 21 banks each. With the exception of Vermont, the District of Columbia, Utah, Nevada, and Alaska, one or more banks were organized in every State and Territory of the Union.

STATES, TERRITORIES, AND RESERVE CITIES.	NUMBER OF BANKS.		INDIVIDUAL DEPOSITS.		TOTAL RESOURCES.	
	1899	1901	1899	1901	1899	1901
New England States						
Maine.....	82	84	\$ 20,336,443.61	\$ 23,091,982.73	\$ 43,408,235.40	\$ 47,163,459.50
New Hampshire.....	52	56	12,082,617.14	14,000,850.73	25,580,127.38	28,961,183.34
Vermont.....	49	47	10,745,431.88	11,705,534.65	24,863,402.19	26,156,055.57
Massachusetts.....	209	209	96,235,164.39	96,137,635.73	183,602,045.53	189,906,273.54
Boston.....	41	38	128,092,238.39	139,000,324.93	272,626,773.76	296,436,672.20
Rhode Island.....	56	38	23,931,291.10	18,579,862.97	57,734,326.55	44,688,644.04
Connecticut.....	80	83	43,284,662.87	44,367,442.19	87,325,368.14	94,013,354.70
Total.....	569	555	\$336,659,949.38	\$346,883,633.93	\$695,140,278.96	\$727,324,642.99
Eastern States—						
New York.....	272	291	\$111,966,478.65	\$ 128,556,170.38	\$ 186,737,940.48	\$ 212,571,859.23
New York City.....	44	43	382,304,293.36	559,932,619.30	882,231,515.97	1,213,803,354.50
Albany.....	6	6	6,887,937.12	6,960,718.37	19,417,378.98	24,599,813.09
Brooklyn.....	5	5	15,081,234.14	12,863,915.62	30,080,929.91	21,946,696.26
New Jersey.....	109	126	68,425,117.28	77,918,119.44	109,088,101.82	127,874,949.61
Pennsylvania.....	369	454	166,964,239.17	210,343,846.78	262,912,992.88	329,300,875.14
Philadelphia.....	36	35	117,910,924.37	125,854,754.02	277,652,461.86	281,604,942.17
Pittsburg.....	31	32	64,055,969.21	80,818,685.09	115,691,144.76	156,033,088.95
Delaware.....	19	21	5,777,769.78	7,153,356.34	10,383,870.32	12,483,241.86
Maryland.....	48	58	12,128,466.68	16,446,080.59	21,183,955.74	27,207,298.69
Baltimore.....	20	20	29,786,277.07	30,061,585.54	66,630,563.61	74,432,163.27
District of Columbia.....	1	1	1,270,575.00	1,139,460.46	2,020,120.55	1,976,852.63
Washington.....	11	11	17,057,073.78	18,706,300.07	23,694,787.10	26,283,896.72
Total.....	971	1,103	\$999,616,355.61	\$1,276,774,508.90	\$1,906,650,763.67	\$2,510,119,032.12
Southern States—						
Virginia.....	36	50	\$ 19,066,638.61	\$ 25,267,481.55	\$ 35,673,829.74	\$ 48,399,322.72
West Virginia.....	35	47	12,706,786.98	19,010,634.12	20,980,183.07	30,579,163.98
North Carolina.....	29	36	7,471,456.90	8,341,189.43	14,136,066.20	17,384,992.37
South Carolina.....	16	17	5,954,920.71	5,619,339.32	11,396,233.26	12,863,637.24
Georgia.....	25	33	8,557,866.73	13,629,318.84	16,061,218.06	26,516,531.41
Savannah.....	2	2	923,419.18	687,796.92	2,563,595.64	2,634,969.51
Florida.....	15	17	5,685,834.69	7,935,801.53	8,636,420.07	12,150,439.58
Alabama.....	27	37	10,910,069.03	13,527,431.35	17,933,914.11	23,039,158.26
Mississippi.....	12	14	3,683,097.84	4,362,067.62	6,445,867.54	7,780,381.94
Louisiana.....	13	19	3,924,097.97	6,949,174.67	6,263,645.96	11,307,765.52
New Orleans.....	7	8	16,343,509.03	19,729,731.70	26,163,567.22	38,006,101.21
Texas.....	194	284	50,525,780.18	72,770,398.29	90,438,918.76	128,047,883.67
Houston.....	5	6	3,721,003.50	5,879,242.70	7,250,160.66	10,968,183.22
Arkansas.....	7	10	2,961,867.74	4,216,118.83	5,013,801.78	7,033,537.01
Kentucky.....	67	78	17,639,325.72	20,236,215.21	35,164,327.53	40,184,406.40
Louisville.....	7	8	7,732,042.05	9,434,396.69	22,191,862.03	31,566,869.34
Tennessee.....	47	56	21,906,665.72	24,347,067.85	39,972,973.63	45,503,213.31
Total.....	544	722	\$199,632,382.58	\$261,943,355.62	\$366,226,594.98	\$491,986,565.60

STATES, TERRITORIES, AND RESERVE CITIES.	NUMBER OF BANKS.		INDIVIDUAL DEPOSITS.		TOTAL RESOURCES.	
	1899	1901	1899	1901	1899	1901
<i>Middle Western States—</i>						
Ohio.....	230	263	\$ 89,379,972.46	\$101,008,720.65	\$ 146,591,446.71	\$ 164,380,661.73
Cincinnati.....	13	13	27,681,741.64	31,154,598.70	66,016,469.12	71,356,367.17
Cleveland.....	14	18	28,579,229.96	27,785,968.32	57,237,968.44	74,076,806.77
Columbus.....	a			10,439,762.21		17,543,613.39
Indiana.....	109	131	43,685,572.61	53,238,104.60	67,887,020.99	82,628,020.89
Indianapolis.....	4	6	11,745,199.89	14,268,528.06	23,522,500.67	33,326,926.68
Illinois.....	208	246	66,336,423.42	96,993,526.27	106,089,191.92	148,147,797.97
Chicago.....	16	12	100,541,688.48	124,661,662.34	226,451,153.80	300,394,842.80
Michigan.....	74	79	36,540,442.88	45,540,314.50	54,330,745.15	65,581,238.59
Detroit.....	6	6	13,380,069.21	14,053,247.45	27,187,772.52	29,960,277.15
Wisconsin.....	75	91	34,436,137.81	44,996,937.91	47,601,539.11	61,237,617.35
Milwaukee.....	4	5	24,038,175.69	26,635,319.18	35,782,626.91	40,729,631.81
Minnesota.....	58	88	22,166,365.38	30,605,495.77	30,992,872.97	43,106,488.74
St. Paul.....	5	5	12,728,785.63	14,891,006.74	24,192,715.11	29,556,701.89
Minneapolis.....	6	4	11,236,045.74	13,881,924.19	22,806,715.03	30,726,119.42
Iowa.....	169	221	40,762,106.15	59,596,062.66	71,249,206.44	104,460,487.61
Des Moines.....	4	4	2,587,712.40	2,640,888.08	7,489,795.75	9,663,141.75
Missouri.....	50	57	11,769,686.91	14,706,007.49	17,839,068.96	23,321,729.80
St. Louis.....	6	7	36,282,137.81	44,498,107.83	84,706,899.30	130,569,961.51
Kansas City.....	5	6	17,164,019.81	23,879,514.49	43,823,312.10	69,024,422.21
St. Joseph.....	2	2	2,389,680.43	3,188,618.98	5,242,148.10	8,536,571.22
Total.....	1,053	1,270	\$638,416,114.16	\$796,634,268.22	\$1,166,001,649.10	\$1,588,557,325.55
<i>Western States—</i>						
North Dakota.....	23	36	\$ 6,225,491.32	\$ 8,618,824.45	\$ 8,975,801.96	\$ 12,642,076.51
South Dakota.....	25	35	5,770,204.95	8,300,364.83	8,963,498.59	12,348,090.36
Nebraska.....	88	107	16,373,022.09	22,934,783.69	27,418,035.23	37,633,086.81
Lincoln.....	3	3	1,784,380.97	2,438,469.81	2,979,317.96	5,084,296.87
Omaha.....	8	7	10,702,257.32	12,240,609.18	26,156,683.13	30,400,440.93
Kansas.....	98	119	24,755,511.70	33,615,130.70	41,173,231.40	62,439,129.10
Kansas City.....	a	1		2,364,463.76		8,101,432.45
Montana.....	21	22	13,619,625.35	14,624,646.07	19,528,459.22	20,604,097.37
Wyoming.....	11	14	3,518,035.91	4,228,063.24	5,018,240.62	6,215,587.62
Colorado.....	36	39	43,745,352.21	25,810,397.97	64,613,848.06	35,442,340.56
Denver.....	a	4		26,525,324.25		42,319,627.78
New Mexico.....	7	10	3,700,274.34	4,431,740.99	5,462,140.66	6,520,646.00
Oklahoma.....	9	49	1,669,879.83	9,442,360.57	2,522,493.39	14,085,963.61
Indian Territory.....	15	54	1,918,749.74	5,510,341.85	3,499,253.21	10,009,869.12
Total.....	344	500	\$138,772,785.73	\$181,085,501.31	\$215,310,008.41	\$268,746,708.39
<i>Pacific States—</i>						
Washington.....	31	32	\$19,774,838.63	\$25,120,391.74	\$27,720,606.78	\$ 34,916,852.47
Oregon.....	24	26	6,315,997.00	6,984,724.70	8,761,236.12	9,604,997.35
Portland.....	4	4	5,399,670.48	6,853,177.53	10,371,261.29	12,375,955.64
California.....	31	35	18,020,323.94	18,606,572.17	27,761,593.25	27,411,537.14
San Francisco.....	4	5	16,631,515.94	18,085,890.49	35,024,878.86	39,793,283.35
Los Angeles.....	a	6		8,609,158.79		13,477,774.80
Idaho.....	9	12	3,762,867.98	4,633,392.61	4,975,345.06	6,079,533.23
Utah.....	11	12	4,799,486.78	6,294,564.60	8,654,400.07	11,262,941.09
Nevada.....	1	1	468,396.66	445,160.47	619,873.58	638,573.82
Arizona.....	5	7	2,138,619.95	2,872,251.79	2,906,696.17	3,794,931.16
Alaska.....	1	1	211,056.61	99,659.12	318,843.26	231,469.60
Hawaii.....	b	1		541,738.83		1,426,516.10
Total.....	121	141	\$77,512,773.97	\$99,096,682.84	\$127,014,633.44	\$161,014,365.75
Total, United States.....	3,602	4,291	\$2,380,610,361.43	\$2,964,417,965.82	\$4,475,343,923.55	\$5,722,730,635.49

a. No reserve bank established until after 1899.

b. Hawaii was not organized as a Territory until 1900, and so did not come within the scope of the national banking law in 1899; the returns given for 1901 are those of September 30.

While many of the new national banks of the smaller kind were conversions of State and private banks, nevertheless the total amount of capital and the total banking business in the United States increased largely during the two years of 1900 and 1901. The actual increase in the number and power of national banks for the entire two years of 1900 and 1901 is shown in the following table, tabulated from reports made by the comptroller of the currency, on the condition of national banks on December 2, 1899 and on December 10, 1901. From these reports it is seen that the total number of national banks increased from 3,602 to 4,291; the individual deposits, from \$2,380,610,361.43 to \$2,964,417,965.82; while the total resources of all national banks increased from \$4,475,343,923.55 to \$5,722,730,635.40. At the same time, the loans and discounts of all banks increased from \$2,479,819,494.90 to \$3,038,255,447.04; the paid-up capital stock increased from \$606,725,265 to \$665,340,664; and the surplus funds increased from \$250,367,691.89 to \$287,170,337.02.

Considered by States and groups of States, the preceding table shows large increases throughout all the country with the exception of the New England States. They, indeed, show hardly any increase in banking resources, if the increase in the banks of Boston, a central-reserve city, is excluded. The increase in the Eastern States is the largest in any section of the country, though a large part of this increase is not distributed uniformly, but centred in New York City, whose banks increased in resources during the two years by over \$250,000,000, and in deposits, by \$177,000,000. The Southern States showed a relatively large increase in resources from \$366,226,594.98 to \$491,968,565.69. Speaking generally, this increase was fairly evenly distributed, although by far the largest individual increase was that in Texas. The largest increases made in the Middle Western States was in Chicago and in Iowa. The increase in the Western States showed some phenomenal increases, as, for example, in Oklahoma, where the total resources of national banks increased from \$2,522,493.39 to \$14,035,963.51, and in Indian Territory, where the resources increased from \$3,499,253.21 to \$10,009,889.12. A large part of the increase in these Territories, however, was due to the conversion of State and private banks. The Pacific States showed on the whole an increase hardly in proportion to the development of their resources, and very small in comparison with their possibilities of agricultural and mining development. The State of Washington showed the largest increase in this group, this increase being probably largely due to the growth of Spokane and the port cities on Puget Sound.

For other banks in the United States, see SAVINGS BANKS, STATE BANKS, TRUST AND LOAN COMPANIES, and PRIVATE BANKS. For the resources of all banks in the United States, see BANKS-BANKING (paragraph Resources of Banks in the United States).

NATIONAL EDUCATIONAL ASSOCIATION. See EDUCATIONAL ASSOCIATION, NATIONAL.

NATURAL GAS. The value of the natural gas sold in 1900 in the United States was greater than that of any preceding year, although the quantity produced was less. The former amounted to \$23,606,463, against \$20,074,873 in 1899, showing a gain of 17½ per cent. With an average price of 18.5 cents per thousand cubic feet, this would mean about 127,602,500,000 cubic feet; an amount equivalent, it is stated, to 6,380,000 tons of coal. The supply came from fifteen States, of which Pennsylvania, Indiana, West Virginia, and Ohio were the most important. About 97 per cent. of the gas used comes from the Appalachian region, northwestern Ohio, and northern Indiana. It is difficult to give the production by States, for the reason that much of the gas produced in one State may be piped across the line into another—natural gas even being piped from Canada into the United States. At the close of 1900 there were 10,506 producing wells, or a gain of 768 over 1899. During the former year 991 wells were abandoned, and 359 dry holes drilled. The length of pipe line having a diameter of two inches or over completed in 1900 was 11,570,204 feet, or 21,048 miles. The largest pipe used has a diameter of 36 inches. During 1900 an extension was found of the Bayard gas sand near Waynesburg, Greene County, Pa. This was struck at a depth of 2,410 feet below the Pittsburg coal, and the fact of its remaining unknown so long as it has, was due to the fact that none of the older wells was run deep enough to penetrate it. The wells here have a regular rock pressure of over 1,000 pounds per square inch. There was a decline in the other Pennsylvania fields, as well as in those of West Virginia, New York, and Ohio. In the Indiana fields the rock pressure has dropped from 325 pounds, in 1886, to 110 pounds at the end of 1900. As a result of this, gas compressors are now being used by some of the companies furnishing natural gas. In Kansas the Iola gas field continues to be an important source of fuel for the zinc smelters now located in the southeastern part of the State. In 1900 the 1,438 companies and individuals doing business in the United States supplied gas to 706,309 domestic fires, 74 iron mills, 9 steel-works, 209 clay-works, and 5,387 other establishments.

NATURAL SCIENCES, ACADEMY OF (PHILADELPHIA), was founded in 1812, and is the oldest American institution devoted exclusively to the study and advancement of the natural sciences. In 1901 the academy had issued eleven volumes of its present *Journal*, Vol. LIII. of *Proceedings*, Vol. XXX. of the *Manual of Conchology*, and Vol. XII. of the *Entomological News*, besides twenty-five volumes of *Entomological Transactions*. The museum of the academy is important, and some of its collections are unequalled elsewhere. The library of about 60,000 volumes is one of the most valuable collections of exclusively scientific books in America. The academy maintains a fund for the assistance of students, and holds important courses of lectures. President, Samuel C. Dixon, M.D.; secretary, Benjamin Sharp, M.D.

NAVAL ACADEMY, UNITED STATES, Annapolis, Md., established 1845. The faculty during the year 1900-01 consisted of 71 members, and the student-body 333, divided as follows: First class, 61; second class, 52; third class, 72; fourth class,

148. On October 1, 1901, the policy recently adopted by the academy requiring all examinations for the admission of candidates to be held under the supervision of the Civil Service Commission, went into force. While each member and delegate in Congress continues to have the appointment of one and the President of 10 naval cadets, these appointees must now pass the examination indicated above, in addition to a physical examination by the board of the academy. The present superintendent is Commander Richard Wainwright.

NEBRASKA, a central western State of the United States, has an area of 77,510 square miles. The capital is Lincoln. Nebraska was organized as a Territory May 30, 1854, and admitted as a State March 1, 1867. The population in 1900 was 1,066,300, while in June, 1901, as estimated by the government actuary, it was 1,067,000. In 1900, the three largest cities and their populations were: Omaha, 102,555; Lincoln, 40,169; and South Omaha, 26,001.

Industries.—The census reports of 1900 show a considerable growth in the manufacturing industries of Nebraska during the last forty years, although it is primarily an agricultural and stock-raising State. In that time, the population increased from 28,841 to 1,066,300, while the average number of industrial wage-earners increased from 336 to 24,461, embracing in 1900, 2.3 per cent. of the total population. In the latter year, the amount of actual capital, exclusive of capital stock, invested in the 5,414 mechanical plants reporting, was \$71,982,127, the gross value of the products was \$143,990,102, while the net value, excluding products re-used in the process of manufacture, was \$115,294,414. Agricultural and stock-raising products are largely the bases of Nebraskan manufactures, but industries along other lines are being stimulated by the cheap transportation North and South furnished by the Missouri River, forming the eastern boundary of the State for 500 miles and navigable 200 miles above Omaha, and by the transportation facilities in other directions afforded by the fifteen railroads entering Omaha. The lack of cheap fuel has hitherto hindered manufacturing, but this difficulty has now been obviated by the development of coal fields in Iowa, Kansas, and Missouri.

Slaughtering and meat-packing is the most important industry of the State, reporting in 1900, products valued at \$71,018,339, an advance of 195.6 per cent. since 1890. In fourteen years, South Omaha has grown to be a city of 26,001, constituting now one of the largest stock markets in the country. Its situation on the Missouri River, the boundary between Iowa and Nebraska, has favored the growth of this industry, as both these are good stock-feeding States, ranking first and third respectively in the corn production (1900) of the United States. Besides live stock raised in these States, sheep and "canning cattle" are sent from many others, thousands of young animals being yearly brought to the Nebraska feed lots to be fattened.

Dependent upon agriculture is the manufacture of cheese, butter, and condensed milk, of flouring and grist mill products, and of malt liquors with products valued in 1900 respectively at \$2,253,893, \$8,100,794 and \$1,433,501. A creamery at Lincoln is said to be the largest in the country. The printing and publishing industry is third in rank, with products valued in 1900 at \$3,431,582. Of this industry Omaha is the headquarters, operating from there extensive plants for publishing country papers from the Mississippi to the Rocky Mountains, with partially printed or "filled" sheets. Other industries reported in 1900 products valued as follows: Car construction and shop work, \$2,624,461; saddlery and harness making, \$1,028,540; planing mills, \$886,333; brick and tile making, \$839,815; beet sugar, \$481,593.

Legislation.—Owing to the legislature being absorbed in the problem of electing two United States Senators, the volume of legislation enacted was very small. Among the laws passed, however, were the following: A law for the registration and protection of trade marks. A law creating a commission to investigate and report to the legislature upon the advisability of adopting the Torrens system of registration for the better security of titles to real estate. An inheritance tax law was passed. Congress was applied to under the Fifth Article of the Constitution of the United States to propose a convention for the adoption of an amendment for the direct election of United States Senators. A law was adopted licensing the practice of osteopathy—provided, however, that the applicants for practice passed an examination satisfactory to State medical examiners. A bill was passed making the game law much more strict and extending its provisions to new species of game and restricting the open season during which game may be shot. Educational laws were enacted providing for the institution of traveling libraries, and compacting the existing school system.

Elections.—After having balloted almost continually since January 15, 1901, the legislature on March 28, the final day of adjournment, elected two United States Senators. John H. Millard, Republican, was elected to succeed John H. Thurston for the full term ending March 4, 1907, and Charles H. Dietrich, Republican, governor of the State, was elected to fill the unexpired portion of the term expiring

March 4, 1905. Mr. Dietrich was chosen in place of William B. Allen, Populist, who had been appointed on the governor's certificate to fill the vacancy caused by the death of M. L. Hayward, Republican, until such time as the legislature chose his successor. The legislature elected in November, 1900, was Republican in both branches, having in the Senate 18 Republicans and 15 Democrats and in the House 53 Republicans and 47 Democrats. The Republicans thus had a clear majority, but several of the Republican members refused to vote for the caucus nominees. The principal incident in the long series of ballots taken before Senators were finally elected was the message received from Senator Marcus A. Hanna, as chairman of the Republican National Committee urging the recalcitrant members of his party to support D. E. Thompson, the caucus nominee, for the short term. To this the voters simply replied that it "would be disgraceful to the State and suicidal to the party." When on March 28 it became evident to Mr. Thompson that he could not be elected he resigned in favor of Mr. Dietrich, and similarly Mr. Edward Rosewater, editor of the *Omaha Bee*, the nominee for the term ending in 1907, resigned in favor of Mr. Millard.

Although the only officer of importance to be elected at the general election in November was a judge of the Supreme Court, much effort was made by both parties, and especially by the Fusion party, to carry the State. At a meeting of the State committees of the Democratic and Populist and Silver Republican parties, held at Lincoln on August 7, it was decided at the advice, if not at the instance, of Mr. William J. Bryan again to nominate a Fusion State ticket, and to hold Democratic and Populist conventions for that purpose on September 17. At the same time the Silver Republicans, owing to the smallness of their party, concluded that it would not be wise to continue as a separate organization and so disbanded. During the latter part of the fall, Mr. Bryan conducted a speaking campaign throughout the State in the hope of reversing the political majority of 1900, when the State had gone Republican by 7,822 votes. Notwithstanding, however, Mr. Bryan's efforts, and although the Republicans were alleged to have suffered from the effects of a political scandal, Samuel H. Sedgwick, Republican candidate for Supreme Court judge, defeated his Fusion opponent, Mr. Hollenbeck, by 12,659 votes.

Republican Convention.—The Republican State convention of Nebraska met at Lincoln on August 27 and on the following day nominated Samuel H. Sedgwick, of York County, for justice of the Supreme Court, and Carl J. Ernst, of Lancaster, and H. L. Goold, of Keith, for regents of the university. The platform adopted commended the course of the national administration in reestablishing prosperity, creating an ever-increasing market for America's bounteous crops, enacting stable financial legislation, quelling "a wicked and unjustifiable conspiracy and insurrection" in the Philippines, and instituting in that archipelago "the principles upon which popular government and the equality of rights depend." With regard to the question of labor *versus* capital, the platform while recognizing the right of wage-earners to organize for mutual protection without in any way being coerced or restrained, stated on the other hand that since every man had the right to the rewards of his labor, boycotting, blacklisting, and lawlessness of all kinds should be abolished. The principal interest of the convention centred around the demand made on the governor in the platform for the revocation of the parole given by him to Joseph S. Bartley, a defaulting State treasurer. The governor had given this parole on the understanding that the ex-treasurer should then return the State funds, and for the further reason that "all possible humiliation" had already been heaped upon Bartley. The convention, however, refused to support the action of the Republican governor, believing that if it did so the voters would claim that the Republicans "condoned the embezzlement."

State Officers.—Governor, E. P. Savage, Republican; lieutenant-governor, C. F. Steele; secretary of state, George W. Marsh; treasurer, William Stuefer; auditor, Charles Weston; attorney-general, F. N. Prout; superintendent of education, William K. Fowler; land commissioner, George D. Follmer. Supreme Court in 1901: Chief justice, T. L. Norval; associate justices, J. J. Sullivan and S. A. Holcomb. Supreme Court in 1902: Chief justice, J. J. Sullivan; associate justices, S. H. Sedgwick and S. A. Holcomb.

Congressional Representatives (57th Congress). In the House—Elmer J. Burkett, from Lincoln; David H. Mercer, from Omaha; John S. Robinson, from Madison; William L. Stark, from Aurora; A. C. Shallenberger, from Alma, and William Neville, from North Platte—all Fusionists except Elmer J. Burkett and David H. Mercer, Republicans. In the Senate—Charles H. Dietrich (until 1905), from Hastings, and Joseph H. Millard (until 1907), from Omaha—both Republicans.

NEBRASKA, UNIVERSITY OF, Lincoln Neb., founded 1869, is part of the public school system of the State. It has no preparatory department, but maintains secondary schools in agriculture, mechanic arts, and domestic science. In 1901 the faculty consisted of 100 professors and instructors, and the student-body numbered 2,256, duplicates deducted, which were distributed as follows: Graduates, 149; col-

lege of literature, science, and the arts, 942; industrial college, 595; law, 163; art, 79; music, 325; summer session, 191. Of these, 1,244 were men, 1,012 women. Beginning with January 1, 1900, the institution receives one mill per dollar upon the assessment roll of the State, and this together with its other sources of income will bring for the biennium ending March 31, 1903, the sum of \$307,500. The library contains 51,000 volumes.

NEGLEY, JAMES S., major-general, U. S. V., died at Plainfield, N. J., August 7, 1901. He was born at East Liberty, Pa., December 26, 1826, and was educated at the Western University of Pennsylvania, which he left to enlist as a private in the Mexican War, serving throughout the conflict with the First Pennsylvania regiment. At the outbreak of the Civil War he raised a brigade of three months' volunteers and received his commission as brigadier-general of volunteers. He fought in Alabama, in Tennessee, and with the Army of the Ohio, and was in command at the battle of Lavergne. For gallantry in action at Stone River, General Negley was promoted to major-general (1863). After the war he went to Pittsburg and was sent to Congress as a Republican, serving from 1869 to 1875 and again from 1885 to 1887.

NEGRO PROBLEM. *Negro Population.*—Some interesting statistics as to the growth of the negro population in the United States and their relative degree of literacy compared with other elements of the population were shown in the reports made in 1901 of the decennial census taken in 1900. By these reports it was shown that the total negro population, which in 1890 was 7,488,788, had increased by 1900 to 8,840,789. At the same time, the total number of white people in the country had increased from 55,166,184 to 66,990,802. The relative increase in blacks was 18.1 per cent., while the relative increase of whites was 21.4 per cent., but while the actual increase of negroes was less than 1,400,000, the actual increase of whites was nearly 12,000,000, or 150 per cent. of the total negro population of the United States. From these figures it would appear that the so-called negro problem will grow less important year by year, owing to the vastly greater numerical increase of the white population over the black. It would seem, also, from the fact that the relative increase of whites is greater than that of the blacks, that there is at least a semblance of truth in the statements made by some of the speakers at the Montgomery conference in Alabama in 1900 to the effect that the vital statistics of the negro race showed that they were deteriorating and might already be classed sociologically if not practically with the "vanishing race." And the appearance of truth which the census figures lent this assertion would be strengthened by the consideration that the negro race, like every race of a comparatively low degree of civilization, is naturally much more prolific than the white race, and therefore the inability of the negroes to maintain a relative increase of population equal to that of the whites would normally point to a marked deterioration in the race fibre. On the other hand, it should be borne in mind that the normal white population has been augmented every year by nearly half a million immigrants, thus leaving a much smaller basis for an accurate deduction of comparative vital statistics.

Geographical Distribution.—With regard to the geographical distribution of the increase of the negro population, the census report showed that by far the largest relative, though not numerical increase, was in the North Atlantic States. While the relative increase of the white population in these States was 20.5 per cent., the relative increase of blacks was 42.6 per cent. New Jersey had relatively the greatest increase in negro population, that is 46.6 per cent. Following New Jersey came Pennsylvania with 45.8 per cent., Massachusetts with 44.4 per cent., and New York with 41.6 per cent. The distribution by localities of the negroes in these States is not given, but it may perhaps be safely assumed that they tended to congregate in the moneyed or thickly peopled localities where personal service of various kinds is required. Next to the North Atlantic division, the South Central States showed the greatest relative increase in negro population, Indian Territory being credited with an increase of 97.7 per cent., and Oklahoma with the remarkable increase of 533.4 per cent. Other single States outside of these two groups that showed large relative increases in negro population were Illinois, where the negro population increased by 49.2 per cent.; Minnesota, where it increased by 34.6 per cent.; Nebraska, where it increased by 29.7 per cent.; Washington, where the increase was 56.9 per cent.; Idaho, where the increase was 45.8 per cent., and Nevada, where the increase was 44.6 per cent. The increase of negro population in the distinctively Southern States seems to show, broadly speaking, that north of the States near or bordering on the Gulf, the white population is increasing so much more rapidly than the blacks that the race problem there will ultimately become unimportant. Since 1880 the white population of Maryland has increased nearly 230,000, while the negro population has increased less than 15,000; in the same time, the white population of Virginia has increased by 312,000, while the negroes have increased only by 29,000. Other States which show much the same disproportionate increases are North Carolina, which has gained 400,000 white people and 93,000 negroes since 1880; Tennessee, which has gained

400,000 whites and 77,000 negroes; Missouri, which has gained 922,000 whites and less than 16,000 negroes; and Kentucky, which has gained very nearly 500,000 whites and only 13,000 negroes. In Mississippi, Alabama, Florida, and Arkansas, on the other hand, the relative number of negroes has increased, while in Georgia it has remained almost stationary. The only two States of the Union at present in which the negroes outnumber the whites are South Carolina, where there are 140,249 negroes to every 100,000 white inhabitants, and in Mississippi, where there are 141,552 negroes to every 100,000 white inhabitants. The other States where the numerical proportion of negroes to whites is the largest per 100,000 inhabitants are Georgia, with 87,600 negroes to every 100,000 whites; Florida, with 77,600 negroes to every 100,000 whites; Louisiana, with 89,199, and Alabama with 82,636.

Comparative Literacy of Negroes.—Prior to 1900 no separate statistics of the average literacy of the negro race were taken. From the census of 1900, however, it appears that while 5.8 per cent. native white male population of voting age was illiterate, 2 per cent. of native whites with foreign parents, 11.15 per cent. of foreign whites, 31.3 per cent. of the Chinese, 33.9 per cent. of the Japanese, and 65.1 per cent. of the Indians, 47.3 per cent. of all the male negroes of voting age were illiterate, thus showing the negroes to have a far greater degree of illiteracy than any other element in the total population of the country excepting Indians, not taxed. The States showing the greatest proportion of illiterate negroes are as follows: Louisiana, with 61.3 per cent. illiterate; Alabama, 59.5 per cent.; Georgia, 56.4 per cent.; South Carolina, 54.7 per cent.; Mississippi, 53.2 per cent.; North Carolina, 53.1 per cent.; Virginia, 52.5 per cent.; Kentucky, 49.5 per cent.; Tennessee, 47.6 per cent.; Texas, 45.1 per cent.; Arkansas, 44.8 per cent.; Delaware, 42.7 per cent.; Maryland, 40.5 per cent.; Florida, 39.4 per cent.; West Virginia, 37.8 per cent.; and Missouri, 31.9 per cent. illiterate. The States showing the least degree of illiteracy are as follows: Utah, with 4.7 per cent. illiterate; Minnesota, 6.9 per cent.; Oregon, 9.5 per cent.; Montana, 10.4 per cent.; Massachusetts, 10.5 per cent.; New York, 11.3 per cent.; Arizona, 11.1 per cent.; Washington, 11.5 per cent.; Nebraska, 11.6 per cent.; Wisconsin, 12.7 per cent.; Connecticut, 13.1 per cent.; California, 14.6 per cent.; Michigan, 14.0 per cent.; and New Hampshire, 14.8 per cent. illiterate. While the very disparate ratio of illiteracy between the first and the second groups of States noted above follows in a great measure the difference between the total negro population in the States, the degree of illiteracy, that is, rising as the number of negroes in the State is increased, it should also be noted that the figures show that the degree of illiteracy seems also largely dependent upon the proportion of the total negro population in the State to the total white population. For example, there is a large colony of negroes both in Massachusetts and in New York; but the degree of illiteracy in these States is less than in many other northern States where the total negro population is much less. But the proportion of negroes to the total white population in both these States is very small. On the other hand, in New Jersey, where the total negro population is smaller than that of New York, but where the proportion of all negroes to the white population is nearly triple what it is in New York, the degree of illiteracy is much greater. In general perhaps it may be inferred from the census returns of illiteracy that where the negroes continue to live and work together the degree of illiteracy remains very high, whereas when they are placed in such employment that they see comparatively little of each other the degree of illiteracy correspondingly declines. In the following table is shown for each State and group of States of the Union (1) the total increase of whites for the decade ending 1900 (2) the per cent. of increase or decrease of whites for the decade, (3) the total increase of negroes for the decade, (4) the per cent. of negro increase during the decade, (5) the per cent. of the entire negro population to the total population, and (6) to the per cent. of illiterate negro males of voting age to the total number of male negroes.

Negro Education in the United States.—For the school year ending in June, 1900, there were enrolled in the colored schools of the south—that is, in Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, Texas, Virginia, West Virginia—1,539,507 pupils, or 51.46 per cent. of the total number of colored children of school age. At the same time, the percentage enrollment for white children was 68.28 per cent. Of these respective enrollments, the colored schools showed an average daily attendance of 62.17 per cent., while the white schools had an average daily attendance of 65 per cent. of their enrollment. The expenditures for common schools for both races in the South for the school year 1899-1900 was \$35,594,071, an increase of \$2,744,179 over the previous year. Of the total expenditure for schools, that given to colored schools was estimated by the commissioner of education at \$7,118,814. Included in the negro enrollment in the public common schools as given above, there were 5,232 pupils in 92 public high schools for the negroes—1,540 boys, and 3,692 girls. At the same time, there were

**INCREASE IN WHITE AND NEGRO POPULATION BY STATES AND TERRITORIES
ARRANGED GEOGRAPHICALLY (1890-1900).**

STATES AND TERRITORIES.	WHITES IN 1900		NEGROES IN 1900 *		NEGROES IN 1900	
	Total increase of whites.	Percent of increase or decrease since 1890.	Total increase of negroes.	Percent of increase or decrease since 1890.	*Per cent. of all negroes to total population.	Per cent. illiterate negro males to total male negroes of voting age.
The United States.....	†11,824,618	21.4	†1,352,001	18.1	11.6	47.3
<i>North Atlantic Division—</i>						
Maine.....	32,963	5.0	129	10.8	0.2	17.8
New Hampshire.....	34,961	9.3	48	7.8	0.2	14.8
Vermont.....	11,853	3.4	†111	†111.8	0.2	19.7
Massachusetts.....	554,391	25.0	9,830	44.4	1.2	10.5
Rhode Island.....	81,191	24.0	1,699	23.0	2.1	15.4
Connecticut.....	158,966	21.7	2,924	23.8	1.7	13.1
New York.....	1,292,926	20.8	29,140	41.6	1.4	11.3
New Jersey.....	415,736	29.8	22,206	46.2	3.7	18.3
Pennsylvania.....	993,406	19.3	49,249	45.8	2.5	17.5
Total.....	3,615,908	20.5	115,114	42.6	1.8	15.3
<i>South Atlantic Division—</i>						
Delaware.....	13,911	9.9	2,311	8.1	16.6	42.7
Maryland.....	125,931	15.2	9,407	9.0	19.8	40.5
District of Columbia.....	96,837	23.8	11,130	14.7	31.1	26.1
Virginia.....	172,733	16.9	25,284	4.0	35.6	52.5
West Virginia.....	185,156	26.4	10,809	33.1	4.5	37.8
North Carolina.....	208,221	19.7	63,451	11.3	33.0	58.1
South Carolina.....	95,799	20.7	93,387	13.6	58.4	54.7
Georgia.....	202,937	20.7	175,998	20.5	46.7	56.4
Florida.....	72,364	32.2	64,550	38.8	43.6	39.4
Total.....	1,113,909	19.9	466,327	14.3	35.7	51.1
<i>North Central Division—</i>						
Ohio.....	475,599	13.8	9,788	11.2	2.3	21.8
Indiana.....	311,768	14.5	12,290	27.2	2.3	27.7
Illinois.....	966,401	25.6	28,050	49.2	1.8	18.7
Michigan.....	325,679	15.7	593	3.9	0.7	14.0
Wisconsin.....	377,083	22.4	98	4.0	0.1	12.7
Minnesota.....	440,628	34.0	1,276	34.6	0.3	6.9
Iowa.....	317,577	16.7	2,008	18.8	0.6	22.0
Missouri.....	416,385	16.5	11,050	7.4	5.2	31.9
North Dakota.....	129,305	70.9	†87	†23.3	0.1	16.5
South Dakota.....	52,704	16.1	†76	†14.0	0.1	16.3
Nebraska.....	9,430	0.9	†2,644	†29.7	0.6	11.6
Kansas.....	89,700	2.9	2,293	4.6	3.5	2.81
Total.....	3,862,057	17.6	64,639	15.0	1.9	24.8
<i>South Central Division—</i>						
Kentucky.....	271,847	17.1	16,635	6.2	13.2	49.5
Tennessee.....	203,549	15.2	49,565	11.5	23.8	47.6
Alabama.....	167,434	20.1	148,818	21.9	45.2	59.5
Mississippi.....	96,349	17.7	165,071	22.2	58.5	53.2
Louisiana.....	171,217	30.7	91,611	16.4	47.1	61.3
Texas.....	680,734	39.0	132,551	27.2	20.4	45.1
Indian Territory.....	192,426	174.5	18,217	97.7	9.4	41.3
Oklahoma.....	305,224	489.9	15,858	533.4	4.7	33.0
Arkansas.....	125,528	15.4	57,739	18.7	28.0	44.8
Total.....	2,214,608	29.1	696,065	19.9	29.8	52.5
<i>Western Division—</i>						
Montana.....	98,593	77.2	33	2.2	0.6	10.4
Wyoming.....	29,727	50.1	18	2.0	1.0	21.2
Colorado.....	124,512	30.8	2,355	37.9	1.6	18.9
New Mexico.....	37,289	26.1	†346	†17.7	0.8	16.3
Arizona.....	37,169	66.7	491	36.2	1.5	11.1
Utah.....	66,540	32.3	54	14.3	0.2	4.7
Nevada.....	†3,716	†3.5	†108	†44.6	0.3	22.9
Idaho.....	72,378	55.1	92	45.8	0.2	15.4
Washington.....	155,475	45.6	912	55.9	0.5	11.5
Oregon.....	92,600	30.7	†31	†5.8	0.3	9.5
California.....	290,894	26.2	†277	†2.4	0.7	14.6
Total.....	1,001,461	34.9	3,173	11.7	0.7	13.4
Alaska.....	26,209	609.8	56	50.0	.....	4.3
Hawaii.....	6,262	10.3	233	.....	0.2	31.2

* Includes all persons of negro descent.

† Includes 90,603 persons (84,209 white, and 6,394 negroes) in the military and naval service of the United States (including civilian employees, etc.), stationed abroad, not credited to any State or Territory.

‡ Decrease.

known to the commissioner of education 145 private institutions for the secondary and higher education of the colored race. These schools had 1,826 teachers, 22,043 pupils in elementary grades, 13,267 in secondary, and 2,386 in collegiate grades, or a total of 37,696 not included in the public school enrollment.

With reference to secondary and higher education for negroes, interesting figures were adduced by the commissioner of education. From these figures, it appears that in 1880 there were out of each million inhabitants in the United States, 4,362 persons in schools of secondary and higher grades; but in that year the colored people had only 1,289 pupils enrolled in secondary and higher education out of every million negro inhabitants. In other words, the white population of the country showed three and one-half times as many pupils in schools of secondary and higher education as the general average for the colored people. In 1890, the number of colored persons in high schools and colleges had increased from 1,289 to 2,061 out of each 1,000,000 of the colored population, and in the year 1900, this proportion had increased to 2,517 out of each 1,000,000 colored inhabitants. But in the meantime, the general average for the United States had increased from 4,362 to 10,743 per million inhabitants. While, that is, the number of negroes in high schools and colleges had increased somewhat faster than the population, it had not kept pace with the general average of the whole country, but had on the contrary fallen from 30 per cent. to 20 per cent. of the average quota. Of all colored pupils, only one in one hundred was engaged in secondary and higher work in 1880, and that ratio has continued substantially for the past 20 years. If then the ratio of colored population in secondary and higher education is to equal the present average for the whole country, it must be increased to five times its present average.

NENCKI, MARCEL, director of the laboratory of physiological chemistry in the Institute of Experimental Medicine at St. Petersburg, died October 14, 1901. He was born in Poland, January 15, 1847, and studied medicine at Berlin, becoming connected with the Pathological Institute of the University of Berne, Switzerland, in 1872. At this institution he was a few years later appointed professor of physiological chemistry and served in this capacity until 1891, when he was called to St. Petersburg to become director of the laboratory of physiological chemistry in the recently established Institute of Experimental Medicine. Professor Nencki's most important investigations dealt with the chemistry of putrefaction, aromatic bodies in the animal organism, animal pigments, especially those of the blood, the chemical processes taking place in the intestine, and the formation of ammonia and urea in mammals. A collection of his works was published in 1897 under the title of *Sommaire des travaux accomplis par M. le professeur M. Nencki et ses élèves dans ses laboratoires à Berne et à St. Petersbourg 1869-1896*. He was one of the editors of *Maly's Jahresbericht über die Fortschritte der Thierchemie*.

NEODERMIN. During 1900 and 1901 experiments were made with one of the few fluorine compounds used in therapeutics, neodermin. This medicament is an ointment whose active ingredient is difluordiphenyl ($C_6H_5.Fl.C_6H_5.Fl$). The latter is a white crystalline powder, with a specific gravity of 1.04 and a melting point of 86°C.; volatile in the steam bath, insoluble in water; soluble in alcohol, ether, chloroform, and the fatty oils. The composition of the ointment is as follows: Fluorpseudocumol, 1; difluordiphenyl, 4; unguenti vaselini, 10; and adepsis lanolin-anhydri, 85 parts. It is a dark amber unguent, translucent, and with a strong odor. It has been found useful in eczema, prurigo, and intertrigo.

NEPAL, nominally an independent kingdom, occupying the southern ranges of the Himalayas between Thibet and British India, but practically a protectorate of Great Britain, has an area of about 54,000 square miles and a population of 2,000,000. The native population is Mongolian, the religion being Hinduism among the upper, and a form of Buddhism among the lower, classes. The country is ruled nominally by a king; but the real power is exercised by the prime minister. The late prime minister, Sir Bir Shamsher, died in March, 1901, after holding power for over fifteen years, and was succeeded by his brother, Deb Shamsher Jang; but in June the latter was displaced through a palace revolution and was succeeded in turn by another brother, Sir Chandra Shamsher Jang. A resident of the British Indian government is stationed at the capital, Katmandu, a city of some 50,000 inhabitants; the resident exercises a certain amount of control in foreign relations, but does not interfere with internal affairs. There is a native army of 35,000 men. The revenue, chiefly the income of land-rents and customs duties levied on the frontier, amounted in 1900-01 to Rs. 15,000,000. In the same year the imports amounted to Rs. 22,728,630, and the exports, chiefly minerals, oils, hides and furs, opium, and timber, Rs. 24,349,280. The rupee is worth 32.4 cents. Coarse woollen cloth, iron, copper, and brass vessels, and bell metals are manufactured.

NERVE IMPULSES. See **PHYSIOLOGY, CHEMICAL**.

NETHERLANDS, a constitutional monarchy of Europe lying between Germany and the North Sea. The capital is The Hague.

Area and Population.—The eleven provinces comprising the Netherlands have a total area of 12,648 square miles. According to the census of December 31, 1899, the population was 5,103,924, as against 4,511,415 ten years before. In 1899 the persons living in towns of over 20,000 inhabitants numbered 1,875,329, or 36.7 per cent. of the entire population. In that year the emigration amounted to 1,347. The populations of the largest towns, according to the census of 1899, were: Amsterdam, 523,557; Rotterdam, 319,866; The Hague, 205,328 (206,023 in 1900); Utrecht, 102,040; and Groningen, 66,739. Complete religious freedom is guaranteed by the constitution to all denominations. There is no state religion, although the royal family and a majority of the population belong to the Dutch Reformed Church, which is Presbyterian in its organization. The adherents of this and other Protestant denominations (in 1889) numbered over 2,620,000; Roman Catholics, 1,596,000, and Jews, approximately, 97,000. The national budget provides fixed allowances for all incorporated churches. Public instruction is free, and since 1900 obligatory for all children between the ages of 6 and 13. The cost of public primary instruction is borne jointly by the state and the communes. There are universities at Leiden, Utrecht, Groningen, and Amsterdam, and museums, navigation, military, technical, and agricultural schools. The official expenditures for education in 1898 were, for the state, £840,750; for the communes, £982,166.

Government.—The executive power is vested in the sovereign. The present ruler is Queen Wilhelmina, who succeeded her father in 1890, and after coming of age on August 31, 1898, was enthroned on the 6th of the following month. The legislative power rests jointly with the sovereign and the parliament, or States-General, consisting of two chambers. The members of the upper chamber, 50 in number, are chosen by the provincial states, or parliaments, from among the highly assessed and official classes. The term is nine years, one-third retiring every three years. The lower chamber numbers 100 deputies elected by direct, restricted suffrage for a term of four years. All legislation must originate in the lower chamber, the upper chamber having the right of approval or rejection, but not of amendment. There is an advisory state council of 14 members appointed by the sovereign, and a responsible ministry, consisting of eight heads of departments. The territory of the Netherlands is divided into eleven provinces, each having its own representative body known as "the provincial states." There are 1,123 communes, whose government is likewise based on representative principles.

Army and Navy.—There is no standing army in the Netherlands in the ordinary sense. The military establishment, recruited partly by voluntary enlistment and partly by conscription, exclusive of the East Indian army which is a separate organization, numbers on a peace footing (1899) about 27,000 officers and men. The war footing is placed at 68,000. Members of the annual contingent, raised by conscription to the number of about 11,000, are required to serve personally, subscription having been abolished in 1898. The term of enlistment, nominally five years, actually consists of not more than twelve months' active service, and six weeks' practice annually thereafter for four years. A militia (*schutterij*) exists, consisting of two divisions known as the active militia and the reserves. The military system was completely reorganized during 1901, with a view to increasing its effectiveness without increasing its size. (See paragraph Army Reform Bill.) The navy, for which the budget of 1901 provided an expenditure of about \$6,730,000, consists, including a number of ships now building, of six armored cruisers, eight protected cruisers, seven monitors, a large number of torpedo boats and destroyers, and partially protected coast-defense vessels and gunboats. The navy is small, but its efficiency is said to be very high.

Finance.—The unit of value is the guilder, valued at 40.2 cents. The budget for the fiscal year ending October 31, 1901, placed the revenue at 149,472,180 guilders, and the expenditure at 154,755,492 guilders. The principal sources of revenue were: Excise duties, 48,510,000 guilders; direct taxes (land, personal, and corporation), 34,802,000 guilders; indirect taxes, 21,667,000 guilders; import duties, 9,618,000 guilders. The principal items of expenditure were: Interest on the public debt, 34,874,568 guilders; public works and dikes, 29,380,074 guilders; finance, 25,108,117 guilders; and the military, 22,716,429 guilders. The East Indian budget, which is separate from the national budget, balanced at 149,885,353 guilders in 1901, of which the Netherlands government furnished the sum of 39,262,928 guilders. The public debt in 1901 amounted to 1,158,735,450 guilders. Estimates of expenditure in the budget for 1902 footed up to a total of 167,000,000 guilders, an excess of 13,000,000 guilders over the estimated revenue.

Industries, Commerce, etc.—The cultivated area of the Netherlands in 1898 was 2,736,238 acres. The chief crops are, in order of importance, rye, potatoes, oats, wheat, beans, and beets. Cattle raising and the fisheries are important industries. In the province of Limburg there are a number of coal mines belonging to the State. The principal manufactures are bricks, butter and cheese, cocoa, and textile

fabrics. The imports and exports, of which no official records as to value are kept, were estimated in 1899 at 1,916,000,000 guilders and 1,583,000,000 guilders respectively. Estimated values (in guilders) of the chief imports in 1899 were: Cereals and flour, 322,532,000; iron and steel, 171,226,000; textiles, 123,547,000; copper, 74,901,000; there were also large quantities of coal, rice, wood, and coffee. Prussia sent the largest percentage of imports, 15.8 per cent., the United States being a close second with a percentage of 15.5. The principal exports, of which 50 per cent. went to Prussia and 22 per cent. to Great Britain, included (1899); cereals and flour, 183,076,000 guilders; iron and steel, 112,810,000 guilders; textiles, 90,023,000 guilders; and oleomargarine, sugar, and vegetables. The merchant marine of the Netherlands according to *Lloyd's Register* for 1901-02 included 423 steamships and sailing vessels, with a tonnage of 578,109. The railways in 1899 had a length of 1,725 miles, of which 968 miles were owned by the state. There were, at the same time, 869 miles of tramways and over 2,000 miles of canals.

HISTORY.

The Queen's Marriage.—Queen Wilhelmina was married at The Hague, on February 7, 1901, to Duke Henry of Mecklenburg-Schwerin. The civil ceremony was performed in the royal palace and was followed by a religious ceremony according to the rites of the Dutch Reformed Church. The wedding ritual was changed by act of the States-General so that the queen would not be obliged to promise to obey her husband or "to dwell with him wherever he deems it best to live." The prince-consort was created a prince of the Netherlands, made an admiral in the Dutch navy, and given a seat in the council of state. The conviction that the marriage was the outcome of a genuine love affair, dissipated, to a considerable extent, the feeling, roused in a great part of the nation when the betrothal was first announced, that because of the fact that the duke was a German prince and army officer, it would be inimical to the independence of the Netherlands and an opening wedge for German influence. That some hostility to the prince continued to exist, became evident, however, in the closing months of the year, from the circulation of highly sensational stories of a disagreement between himself and the queen. According to these reports the prince had brutally insulted and ill-treated the queen, as a result of which a young lieutenant, Van Tets, interfered, and a duel with swords followed, in which the lieutenant was seriously wounded. These stories, which appeared first in the Socialistic continental press, were given little credence by reputable papers in the Netherlands, where it was generally believed that they were the invention of the anti-German party. The *New Rotterdam Courant*, indeed, denied the whole affair in the following statement: "In view of the palpably false rumors lately circulated in foreign papers concerning her Majesty the Queen and his Royal Highness the Prince of the Netherlands, we are authorized to deny these tales and to state on the highest authority that they are absolutely without foundation." It was reported that dissensions had arisen between the prince and the queen and the queen dowager over certain gambling debts that the prince had contracted. With regard to this matter the Oldenburg *Anzeiger* stated that it was untrue that the prince had given himself up to gambling, that he had had no pecuniary embarrassments prior to his marriage, and that he was financially independent. It must be pointed out, however, that the Duchess of Oldenburg is Prince Henry's sister and that the foregoing statement was probably inspired by her.

The Army Reform Bill.—The early part of the legislative session of 1901 was characterized by a most remarkable unanimity in law-making, due perhaps to the fact that the laws enacted were of comparatively small importance. The introduction of the Army Reform Bill, however, almost precipitated a cabinet crisis and showed at the same time the serious weakness of the ministry and dissensions in the Liberal party. The trouble arose from the adoption by the States-General of an amendment that had been rejected by M. Eland, the minister of war. The amendment was supported by the Liberals, and the minister was sustained in his position by his political antagonists. During his incumbency of the office of minister of war, M. Eland had by means of departmental orders practically reduced the term of annual service from 12 to 8 months. This his Liberal supporters expected him to incorporate in the Army Reform Bill; but he preferred to provide for a continuation of 12 months as the legal term, with the understanding that ordinarily the time would be reduced, as theretofore, to 8 months. A large group of Liberals, being joined by the Catholics, who opposed the minister for personal reasons, combined to secure the adoption of an amendment, upon the success of which he resigned, although supported by his colleagues in the Pierson ministry. He was succeeded by General Krool, who effected a compromise by agreeing to a new amendment which provided for an active 8 months' service with a supplementary period of 4 months. With this amendment added the government pushed the bill through, thus providing for numerous reforms in both the regular army and the militia, greatly increasing their efficiency with but little additional expense. This was the ministry's last

victory. Numerous bills, however, were introduced with ministerial sanction, providing among other things for accident insurance for workingmen, large extension of public works, and State regulation of labor contracts. None of them was passed, but their introduction gave rise to a campaign cry that the Liberal party was tending toward Socialism.

Political Parties.—In 1901 the Liberal party had been in power in the Netherlands almost uninterruptedly for a quarter of a century, and its position had come to be looked upon as well-nigh impregnable. In recent years, however, there have been signs of disintegration and dissension within the Liberal ranks, and the various political groups constituting the opposition finally realized that the continuance of the Liberal party in power depended altogether on its being able to prevent them from combining against it. This realization alone was a half victory for the opposition. Unhappily for the Liberal cause, its leaders apparently were not so clear-sighted, but rested in the fancied security that no power could bring together in a common cause the heterogeneous factions opposing them. The hostility between the Liberal party and the Catholics, the most compact and well-organized of its adversaries, had been of long standing; but the latter had never been strong enough alone to overthrow the Liberals, or willing to join forces with any other party in the attempt. The orthodox Protestants, who thought their doctrines menaced more by Liberalism than Catholicism, formed an opposition party known as anti-Revolutionists. For years they had played no important part in politics; but of late, under the leadership of Dr. A. Kuyper, a well-known Calvinistic theologian, have become a very important factor in political life. Holding similar religious views, but not allied to the anti-Revolutionists practically are several smaller Protestant organizations, of which the Historic Christians and the Independents are the largest. The Liberal party has been weak since 1897 and the Pierson ministry was the result of a compromise between its factions, and could only govern by compromises. Most inopportune one of the factions brought forward in February, 1901, a proposition for universal suffrage, clamoring for its adoption as a part of the Liberal platform in spite of the remonstrances of the Moderate Liberals, who decried the tendencies toward radicalism and Socialism. The time was ripe for political revolt. There was a general recoil from Socialistic tendencies, augmented by what one writer termed "the eternal litany of the clerical press" both Catholic and Protestant, which willfully misrepresented the Liberals as being "blasphemous atheists," who aimed at nothing short of the absolute overthrow of all religious belief, whereas their liberalism did not extend to religion, but only to political affairs, one of the cardinal points in their policy being the complete separation of church and State. Such was the situation in the spring of 1901, when Dr. Kuyper shrewdly took advantage of the reactionary trend of affairs, and by great tact effected a coalition of all the anti-Liberal forces, both Catholic and Protestant.

The Elections.—The first warning of the coming Liberal defeat came in the provincial elections on June 12, 1901. The elections to the provincial states is of the greatest importance, since it is these bodies that elect the members of the upper chamber of the States-General. The clerical coalition carried a majority of the provinces, thus making sure its control of the upper chamber. The election of delegates to the lower chamber took place on June 14, and again the combined clericals triumphed, securing 59 out of 100 seats, the division by party groups being as follows: Clericals—Anti-Revolutionists, 30 (Dr. Kuyper's followers 23, independents 7); Historic Christians, 4; and Catholics, 25. Opposition—Liberals, 34; and Socialists, 7.

The New Ministry.—Queen Wilhelmina did not at once call upon Dr. Kuyper to form a ministry, as everyone expected she would; but on July 11, after consulting with her council of state, called upon M. Mackay, a well-known anti-Revolutionist, to undertake the task. M. Mackay declined the offer, and urged the queen to call Dr. Kuyper, which she did the following day. On July 14 Dr. Kuyper accepted, and called in consultation M. Mackay, M. Lohman, of the seceding Liberals, and some Catholic leaders. It took all of Dr. Kuyper's tact to form a cabinet, and it seemed for a time that the fruits of the clerical victory would be lost by dissensions similar to those over which they had triumphed. The absolute necessity of compromise, however, being recognized, the portfolios were at length filled, and a tentative working policy adopted. The cabinet, which beside Dr. Kuyper himself contained very few men of prominence, was made up as follows: Premier and minister of interior, Dr. A. Kuyper, anti-Revolutionist; minister for foreign affairs, Baron Melvil van Lynden, anti-Revolutionist; minister of justice, M. Loeff, Catholic; minister of finance, M. Harte van Teckenburg, Catholic; minister of marine, Vice-Admiral Kruys, Independent; minister of war, Lieutenant-General Bergansius, Catholic; minister of commerce, industry, and dikes, T. C. de Mars Oyens, anti-Revolutionist; minister for the colonies, D. A. J. van Asch van Wijck, anti-Revolutionist.

In the latter part of September, 1901, it was announced that the plan for draining

the Zuyder Zee had been withdrawn from the States-General by the new ministry, because the condition of Dutch finances rendered such an undertaking unadvisable. It was stated in November that diplomatic relations between the government of the Netherlands and the Vatican, which were broken off by the exclusion from the Peace Conference of 1899 of the Pope's representative, were soon to be resumed.

NEVADA, a Pacific slope State of the United States, has an area of 110,700 square miles. The capital is Carson City. Nevada was organized as a Territory March 2, 1861, and admitted as a State October 31, 1864. The population in 1900 was 42,335, while in June, 1901, as estimated by the government actuary, it was 42,000. The largest town is Reno, with a population of 4,500 in 1900.

Industries.—The census reports of 1900 show that the manufacturing interests of Nevada declined steadily from 1870 to 1890, but gained somewhat during the last decade. The population, 42,491, in 1870, had increased 46.5 per cent. in 1880, but since then has dropped to 40,662, while the average number of industrial wage-earners has decreased since 1870 from 2,859 to 601, embracing in 1900, 1.5 per cent of the total population, as against 1.2 in 1890. In 1900 the amount of actual capital, exclusive of capital stock, invested in the 228 establishments reporting, was \$1,472,784, the gross value of the products, inclusive of products re-used in the process of manufacture, \$1,643,675, or 48.7 per cent. more than in 1890. These figures showing an increase are thought to be incorrect and due to a defective canvas for the 1890 census. The decline of gold and silver mining, the chief industries of the State, accounts for the decrease of manufacturing industries and of population. In 1900 the leading manufacturing industries were car construction and repair-shop work, with a product valued at \$295,985; flouring and grist mills, with a product valued at \$157,847, and the making of cheese, butter, and condensed milk, with a product valued at \$148,301.

Legislation.—The Nevada legislature met on January 21 and adjourned on March 16. An interesting franchise law passed provides that street railway franchises may be sold by the officials of the city concerned to the highest bidder; but the bidding corporation is to be required to file a bond for the due fulfillment of its contract, and no franchise may have life longer than 20 years (for a similar law see article CALIFORNIA). Another corporate law directs that every foreign corporation doing business in Nevada shall each year publish in a daily newspaper for a period of one week a statement of its previous year's business and of its financial condition. An act to protect the grazing lands of Nevada provides that all live-stock driven into Nevada from other States and Territories to pasture shall be assessed as personal property and the tax thereon shall be immediately paid, notwithstanding that taxes on the stock may have been paid in some other State or Territory. The discoveries of petroleum in many sections of the United States within the past few years, and more especially the discoveries made in California, probably induced the Nevada legislature to pass an act providing for the payment of a bounty to encourage the boring of wells in search of oil, natural gas, and artesian water. The law enacted that any person first producing 5 barrels of crude petroleum from the State should receive \$1,000; and whoever first discovered natural gas to the extent of 1,000 cubic feet should receive \$1,000; and that whoever first sunk a well 6 inches in diameter to the depth of 1,000 feet and obtained therefrom a flow of 60 gallons of water a minute should receive \$2,500. The criticism directed against this law was that while the bonus was sufficient to be a pleasant surprise to the person obtaining it, it was not sufficient to induce persons to do any large amount of prospecting. In other words, if a bounty was to be given at all, it should be large enough actually to invite speculative prospecting. The election law of 1891 providing that the voter should mark an X in black pencil opposite the name of the candidate for whom he wishes to vote was altered in 1901 by providing that the voter should stamp an X in black ink by a stamp furnished by the county clerk. In this way, it was hoped to avoid alleged frauds by the substitution of pencils other than that required by the law and so invalidating the vote. Congress was applied to under Article V of the constitution to call a convention to propose an amendment providing for the direct election of United States Senators. Congress was also petitioned to allow Indian reservations to be opened for mining and for prospecting for gold, silver, lead, copper, and coal, provided, however, that the Indians raised no objection and that they should be paid by Nevada for all damages sustained. A concurrent resolution was also adopted stating that a bill had passed the United States Senate and was pending in the House authorizing the establishment and maintenance of Schools of Mines in every State where they did not exist, and giving further support to those already established, and asking for the prompt passage of this bill, as it would be of great value to the mineral, road-making, and geologic interests of the country. A law for fixing the boundary line between Nevada and California enacted that a committee should be appointed from Nevada in 1903, provided that the California legislature appointed a similar committee, to jointly confer with the officers of the United States Coast and Geodetic Survey with a view to obtaining the data necessary to directly

fix the oblique boundary line between the two States. A petition to Congress was passed indorsing the resolutions of the National Irrigation Congress held at Chicago in November, 1900. That is to say, Congress was urged to appropriate money for the reformation of arid lands, the preservation of forests, the reforestation of denuded areas as natural storage reserves, the building of artificial reservoirs to conserve for irrigation purposes the water now running to waste, and for the development of artesian and subterranean sources of water supply. In this connection, Congress was especially reminded that there were many thousand acres of land in Nevada uninhabited and of no appreciable value, and that the expense of irrigating these lands was beyond the means of the State. It was also premised that these irrigation schemes should not be undertaken by private individuals, for the water of all streams in the arid country should remain subject to public control, and the right to the use of water for irrigation should inhere in the land irrigated and be used for the benefit of all the people. Two amendments to the constitution of Nevada were proposed as follows: (1) Modifying the clause which asserts that the proceeds alone of mines and mining claims shall be taxed by allowing the legislature to assess at the valuation of \$10.00 an acre "patented mining claims;" (2) whenever 10 per cent. of the voters of the State shall express their wish to have submitted for their approval any law or resolution of the assembly, then such law or resolution shall be submitted for ratification or rejection, and if ratified it shall not thereafter be repealed or annulled except by direct vote of the people.

State Officers.—Elected in 1898, for four years. Governor, Reinhold Sadler, Silver party, term expires January, 1903; lieutenant governor, James R. Judge; secretary of state, Eugene Howell; treasurer, D. M. Ryan; comptroller, Samuel P. Davis; attorney-general, William Woodburn; superintendent of education, Orvis R. Ring; surveyor-general, E. D. Kelley; chief justice of Supreme Court, term six years, ending January, 1903, W. A. Massey. Supreme Court: Chief justice, W. A. Massey; associate justices, A. L. Fitzgerald and C. H. Belknap—all of the Silver party.

Congressional Representatives (57th Congress). In the House—Francis G. Newlands, Fusionist, from Reno. In the Senate—John P. Jones (until 1903), from Gold Hill, originally a Republican, left that party upon the Silver issue, but announced his return in 1901; and William M. Stewart (until 1905), Republican, from Virginia City.

NEVIN, ETHELBERT, American composer, died at New Haven, Conn., February 17, 1901. He was born at Edgeworth, Pa., November 25, 1862, and was destined for a mercantile career. His musical ability early showed itself, however, and he began his studies with the ambition of becoming a piano virtuoso. After studying at Pittsburg and Boston, in 1884 he went to Berlin, where he was under the instruction of Karl Klindworth and Hans von Bülow, who persuaded him to devote his attention to composition. He returned to Boston in 1887 and settled there, composing and playing a little in public; but much of his later life was spent abroad, in Paris, Italy, and Algiers, where many of his works were written. In 1900 he became associated with Professor Parker in the department of music, Yale University. Nevin became one of the foremost figures in American music, through his many songs and piano pieces, all characterized by a sympathy and daintiness that have commanded their vogue. His best-known composition is *Narcissus*, one of his *Water Sketches*. Other piano pieces are *Mary in Tuscany*, and *A Day in Venice*; and of his songs, which are more sung to-day than those of any other American composer, *Good Night*, *Good Night, Beloved*; *Cradle Song*; and *The Rosary*, are the most widely known.

NEW BRUNSWICK. A province of the Dominion of Canada, with an area of 28,200 square miles. According to the census of 1901 the population was 331,120, against 321,263 in 1891, showing an increase of a little over 3 per cent. Capital, Fredericton, with a population of about 7,000. The public schools are supported partly by the government and partly by municipal and district assessments. In 1900 there were in the province 1,771 public schools with a total enrollment of 61,444. There were besides 946 pupils in the grammar and 256 in the normal schools.

Government and Finance.—The province is administered by a lieutenant-governor assisted by an executive council; there is only one chamber, a legislative assembly of 46 members elected on a property qualification. In the Dominion Parliament the province is represented by 10 members in the Senate and 14 in the House of Commons. The revenue shows a decrease from \$764,439 in 1899 to \$758,989 in 1900, while the expenditure increased for the same period from \$749,644 to \$794,477. The principal item in the revenue was the Dominion subsidy, \$483,492, and in the expenditure education, \$203,983. Besides the increase in the deficit, the debt of the province shows an increase from \$3,324,986 in 1899 to \$3,449,966 in 1900.

Industries, Commerce, etc.—The chief industry is fishing. The total value of the catch for 1899 was \$4,119,891, against \$3,849,357 for the preceding year. The principal kinds were herring, \$1,195,979; sardines, \$496,892; and smelts, \$351,690.

The leading crops for 1900 were: Oats, 5,281,690 bushels; potatoes, 4,797,769 bushels; buckwheat, 1,527,610 bushels; and spring wheat, 504,301 bushels. All the crops show an increase over the preceding year. The trade of the province for 1900 shows a remarkable increase. The imports rose to \$6,673,709 from \$5,440,733 in 1899, while the exports increased to \$14,165,506 from \$10,492,329 in 1899. Of the imports, over \$6,000,000 represented United States produce. The merchant marine of New Brunswick consisted at the end of the calendar year 1900 of 927 sailing vessels and steamers with a total tonnage of 78,708. At the end of the fiscal year 1900 New Brunswick had 1,438 miles of railway track laid, and had paid out in railway subsidies of all kinds the amount of \$4,907,041.

NEWCOMB, Mrs. JOSEPHINE LOUISE, American philanthropist, died in New York City, April 7, 1901. She was born at Baltimore, Md., in 1821, and married Warren Newcomb at New Orleans, La., about 1850. Afterwards, with her husband, she moved to New York City, where she passed the remainder of her life. Upon the death of her daughter she determined to establish a woman's college as a memorial to her, and in furtherance of this plan donated \$1,000,000 for the creation of the H. Sophie Newcomb College in connection with Tulane University (New Orleans). By the terms of her will practically all of her fortune, estimated at \$1,500,000, was added to the endowment of the institution.

NEWELL, ROBERT HENRY ("Orpheus C. Kerr"), American author, died in Brooklyn, N. Y., July 1, 1901. He was born in New York City, December 13, 1836, and received an academic education. From 1858 to 1862 he was literary editor of the *New York Mercury*; he was on the staff of the *New York World* (1869-74); and from 1874 to 1876 he was editor of a weekly paper called *Hearth and Home*. In the sixties and seventies Mr. Newell was one of the best known of American humorists. He wrote: *The Orpheus C. Kerr Papers* (1862-68); *The Palace Beautiful, and Other Poems* (1864); *Avery Glibun; or, Between Two Fires: A Romance* (1867); *Smoked Glass* (1868); *The Cloven Foot* (1870); *Versatilities* (1871); *The Walking Doll* (1872); and *Studies in Stanzas* (1882).

NEWELL, WILLIAM AUGUSTUS, former governor of New Jersey, died at Allentown, N. J., August 8, 1901. He was born at Franklin, O., September 5, 1819, and was educated as a physician. In 1846 he was elected to Congress from New Jersey as a Whig, and was reelected in 1848. At Washington he formed an acquaintance with President Lincoln and became his attending physician. He was elected Republican governor of New Jersey in 1856, the first of that party to fill the office. Dr. Newell was the originator of the present United States life-saving service, planning the system, and introducing the bill that established it. He invented the apparatus for firing lines from mortars to ships in distress. In 1880 he was appointed governor of Washington Territory, and four years later was made Indian commissioner for that Territory.

NEWFOUNDLAND, a British colony of North America comprising the island of Newfoundland and a part of Labrador. The area of the island is 42,200 square miles, and that of its dependency, 120,000 square miles. The population of the island and of the part of Labrador belonging to it is estimated at 210,000 and 5,000 respectively. Capital, St. Johns, with an estimated population of over 31,000. Over one-third of the inhabitants are Roman Catholic; about one-third belong to the Church of England; and most of the remainder are Methodist.

Government and Finance.—The colony is administered by a governor, who is assisted by an executive council of 9 members. There is a legislative council of 15 members appointed for life, and a legislative assembly of 36 members, elected by popular vote for four years. On June 16, 1901, Sir Cavendish Boyle, government secretary of British Guiana since 1894, became governor of the colony in succession to Sir H. E. McCallum, who proceeded to Natal as governor. The financial condition of the colony is very prosperous. The public revenue for 1900 amounted to \$2,242,048, against a little over \$1,100,000 for the preceding year. The expenditure for 1900 was \$1,983,445, against \$1,777,000 for 1899. The public debt in 1900 was \$17,376,774, showing an increase of \$300,000 over the preceding year.

Industries and Commerce.—The chief industry of the colony is fishing, although the forests and mineral deposits are exploited to an increasing degree. The value of the annual products of the fisheries amounts to over \$6,000,000. The mines yield an annual product exceeding \$1,000,000 in value. Agriculture is necessarily limited by the unfavorable climatic conditions, and the yield of agricultural products is hardly sufficient to meet the demand. The lumber and wood-pulp industries have shown a considerable increase of late, and the mineral industry will probably be considerably promoted by the completion of the colonial railway system. The imports and exports in 1900 amounted to \$7,497,147 and \$8,627,576 respectively. The trade with the United States for 1901 shows a considerable increase over the preceding year, the

imports from the United States for 1901 and 1900 being \$2,102,173 and \$1,881,629 respectively; and the exports, \$571,467 and \$403,305 respectively.

Settlement of the Railway Question.—The year 1901 witnessed the settlement of one of the most important economic questions in the history of the colony. The famous "Reid Deal," by which the colonial railway system of 638 miles, the government telegraph lines, with a total length of over 1,000 miles, and the dry-docks, were leased on March 15, 1898, to Mr. Robert G. Reid for a period of 50 years at a practically nominal rent, aroused public opposition; and after the victory of the Liberals in 1900, strenuous efforts were made to have the contract revoked. The attempt of Mr. Reid to launch a joint stock company for the exploitation of the concessions secured from the Winter government gave Mr. Bond, the Liberal premier, the long-sought opportunity, as the formation of a joint stock company was a violation of the provisions of the contract. After a prolonged struggle the question was settled in 1901, with extremely advantageous results to the government. According to the terms of settlement, the railway and telegraph lines are to revert to the government upon the payment of \$1,000,000 and the interest for three years at the rate of 6 per cent. The 3,200,000 acres of land, which formed a part of the concession, are also to be surrendered for the sum of \$830,000. The government in its turn leases to Mr. Reid the railways for 50 years without guarantee, and reserves for itself the right to dictate all necessary improvements on the lines, as well as all improvements tending to develop the natural resources of the island, and to promote immigration.

The French Shore Question.—The settlement of this vexatious question was again postponed in 1901 on account of the preoccupation of the imperial government with South African affairs; and the *modus vivendi* was renewed on February 27 for another year. Opinions expressed by leading French journals declared that the French government was willing to give up its rights on the Newfoundland coast for compensation such as cession of the Gambia colony, but that it would not consent to consider the question unless it were previously understood that the French rights were incontestable and uncontested. On an interpellation in the French Chamber M. Delcassé, minister for foreign affairs, confirmed the incontestability of the treaty rights.

The United States Shore Question.—Reciprocity in fisheries between the United States and Newfoundland received its share of attention at the end of the year. Premier Bond expressed himself in favor of the renewal of the Bond-Blaine convention. The Canadian as well as the imperial government, however, manifested its opposition, on the ground that there were more important issues to be first settled between the United States and Canada.

A disastrous fire in September at St. Johns, resulted in damage to the amount of \$500,000.

NEW GUINEA, or PAPUA, the largest island in the world, after Australia, from which it is separated by the Towes Strait, is 1,490 miles long, 430 miles wide at the greatest breadth, and has an estimated area of 306,000 square miles. It comprises three dependencies, belonging, respectively, to Great Britain, Germany, and the Netherlands.

British New Guinea, a colony comprising the southeastern part of the island, has a mainland area of 87,786 square miles, besides islands that aggregate 2,754 square miles. The population is estimated at about 350,000, of whom about 300 are European. The colony is divided for purposes of administration into 4 magisterial districts, with a central court at Port Moresby, which sits, however, at any place where it is needed. The government is vested in a lieutenant-governor and a nominated legislative council of not less than two other persons. In November, 1901, the Commonwealth of Australia undertook the administration of the government. The trade of the colony with European countries is being constantly improved. The revenue for 1899 was £11,683, mostly derived from customs duties, and the expenditure £15,583. In the same year the imports reached a value of £52,170, and the exports £68,476. The principal exports were: gold, £44,185; pearl shell, £10,287; sandal wood, £2,920; and copra, £2,907. Four missionary societies, three Protestant and one Catholic, are at work.

During the year 1901 large numbers of the natives died of whooping cough that was introduced by two white children from Cooktown. Large sections of the country were subject to its ravages. The natives attributed these fatalities, and the disease itself, to witchcraft and the sorcery of other tribes. The consequence of this was seen in midnight massacres. On April 8, 1901, two missionaries of the London Missionary Society, Rev. James Chalmers and Rev. Mr. Tomkins, with thirteen native missionaries, were murdered at Dophima on the Fly River by hostile natives. In the following month the governor led a small expedition to the scene of the murders, and destroyed the war canoes and houses of the fighting men. They found these houses ornamented freely with human skulls, 700 being found in one house, in

another 400. Dr. Chalmers was regarded as a man of great character and ability. He was succeeded in this mission by Rev. Dr. W. G. Lawes.

Kaiser Wilhelm's Land, the official name of the German colony of New Guinea, constitutes the northern division of the eastern part of the island, having an estimated area, including several adjacent islands, of 69,027 square miles, and a population estimated at 110,000, of whom, in 1899, 58 were Europeans. The colony is governed with the Bismarck Archipelago (*q.v.*) and Solomon Islands, by an imperial commissioner, whose seat of government is at Herbertshöhe in the archipelago, the local capital being at Friedrich Wilhelmshafen, one of the chief ports. Cotton, tobacco, cocoa palms, of which more than 36,000 are under care, and other products common to the tropical islands, are raised. Gold has recently been discovered in the Bismarck mountains. The exports for 1900 were valued at 212,117 marks, and the imports 377,681 marks.

Dutch New Guinea comprises the western division of the island, and forms about one-half its area, or 157,789 square miles, with a population estimated at about 200,000, of whom all but about 1,000 are natives, the European population being about 300. The population is uncivilized, and the soil little cultivated. Most of the districts are under the rule of the native sultans. The colony is governed by the Netherlands, so far as government exists, as a part of the residency of Ternati, Molucca Islands, and is administered partly by Dutch officials and partly by native chiefs. There are a few schools for instruction of the natives.

NEW HAMPSHIRE, a New England State of the United States, and one of the original thirteen, has an area of 9,305 square miles. The capital is Concord. The population in 1900 was 411,588, while in June, 1901, as estimated by the government actuary, it was 415,000. The populations of the two largest cities in 1900 were: Manchester, 56,987; Nashua, 23,898.

Finances.—At the beginning of the fiscal year, ended May 31, 1901, the balance in the treasury was \$456,527.32. The receipts for the year were \$1,273,657.35, making a total of \$1,730,184.67. The expenditures during the year were \$1,282,277.65, leaving a balance on hand June 1, 1901, of \$447,907.02. The State debt on the same date amounted to \$1,008,632.91, of which \$995,300 was bonded, a reduction of \$110,166.03 during the year. The total valuation of State property as returned for taxation for the year 1900-01 was \$212,687,051.

Industries.—In 1850 agriculture was the leading pursuit in New Hampshire; but in 1900 this place had been usurped by manufactures. While the barrenness of the soil and the increasing competition of the West were the principal reasons for this change, the abundant water power of New Hampshire and the proximity of its southern section to the business and financial centre of New England, were also important factors. How rapid the growth of manufactures has been is shown by the fact that the increase in population from 1850 to 1900 was only 29.4 per cent., while the average number of industrial wage-earners increased from 27,092 to 70,419, a gain of 159.9 per cent. The amount of actual capital invested in 1900 in the 4,671 manufacturing establishments reporting was \$100,929,661; the gross value of the articles manufactured was \$118,669,308, and the net or true value, deducting the value of articles re-used in the process of manufacture, was \$77,225,568. The value of the products of the leading industries in 1900 is as follows, the value of the same products in 1890 being given in parenthesis: boots and shoes, factory product, \$23,405,558 (\$11,086,003); wool manufactures, \$10,381,056 (\$10,769,240); cotton goods, \$22,998,249 (\$21,958,002); lumber and timber products, \$9,218,310 (\$5,641,445); paper and wood-pulp, \$7,204,733 (\$1,282,022); foundry and machine-shop products, \$3,049,334 (\$2,895,716); hosiery and knit goods, \$2,592,829 (\$3,481,922). Manchester, the manufacturing centre of the State, turned out products in 1900 valued at \$26,607,600, or 22.4 per cent. of the total value of articles manufactured in the State. In 1890 the value of the Manchester products was \$20,187,925, so that there has been a gain of 31.8 per cent.

Legislation.—The legislature met on January 2 and adjourned on March 22, 1901. One of the most important acts passed was that providing for the reorganization of the supreme court. The existing supreme court of seven judges was abolished, and there was established instead a supreme court of five judges and a superior court of five judges. The superior court is to retain the jurisdiction which the former supreme court had at trial terms; that is to say, the superior court is to be a final tribunal on matters of fact, while the supreme court is to have appellate jurisdiction in questions of law. To the governor was given power to nominate the officers of both courts and this led to some suspicion that the court reorganization had been largely made for political reasons. The governor, however, renominated all the seven judges of the previous supreme court, namely, Isaac N. Blodgett, William M. Chase, Robert M. Wallace, Frank N. Parsons, Robert G. Pike, Robert J. Peaslee, and John E. Young. In addition and in order to make up the two full courts provided for, he nominated Reuben E. Walker, James W. Remick, and Charles F. Stone.

Another act of importance passed by the legislature was that making provision for the election of delegates in November, 1902, to revise the State constitution. Under the existing constitution, it is provided that the electors shall vote every seven years on the question as to whether or not the constitution shall be revised. This question was affirmatively voted upon in the elections of 1900, although there had been no previous agitation for constitutional revision. In accordance with the election results, the legislature provided for a convention to meet at Concord in December, 1902, and to prepare amendments to be submitted for ratification to the voters. An act to prevent hunting and fishing clubs from acquiring an undue amount of property in New Hampshire provided that henceforth no hunting or sporting clubs should hold or acquire property in New Hampshire without first being incorporated by the legislature. Moreover, all bodies of fresh water in the State with an area of 20 acres or more were declared to be public waters held in trust for public use, and corporations and individuals were henceforth to be denied any rights to these waters not held in common by all citizens of the State. A law for the indeterminate sentence of criminals provides that convicts not habitual criminals or sentenced for life, shall hereafter not be sentenced for any definite time, but for maximum and minimum periods which are to be established by law. If the prisoners preserve good conduct while in prison, they are to be entitled to release at the expiration of the minimum period. Other acts were as follows: Employment bureaus are required henceforth to be licensed. Towns as well as cities are authorized to provide by ordinances for the regulation of plumbing and the issuance of licenses to plumbers. Upon petition of 5 per cent. of the legal voters of any city or town it is made the duty of the local school board to maintain, in addition to the other schools required by law, evening schools for the instruction of persons over fourteen years of age. A law identical with one passed by Massachusetts in 1899 finally established the boundary line between Massachusetts and New Hampshire. A commission was authorized, to be appointed by the governor, to investigate the advisability of establishing a State hospital for consumptives, and to report upon the same at the next session of the legislature. Penalty for kidnapping was made from 5 to 30 years' imprisonment. Among important proposed measures which failed of passage was one to restrict lumber cutting to trees of a prescribed size, and also one authorizing the establishment of a State forest reserve. Both of these were measures for the preservation of the forests and were opposed by the lumbermen. A very mild anti-prohibition measure, which also failed of passage, provided that in towns of 2,500 or more inhabitants the question of granting liquor licenses should be submitted to the voters biennially. A proposition was also voted down to petition Congress for an amendment to the constitution for the direct election of United States senators.

Elections.—On January 15 the New Hampshire legislature elected Judge Henry E. Burnham United States senator for the full term ending March 4, 1907. The vote in the two houses was as follows: in the Senate, Burnham, 22; Charles F. Stone, (Dem.), 1; not voting, 1; in the House, Burnham, 279; Stone, 83; Henry M. Baker, 1; not voting, 34. Mr. Burnham was elected to succeed the Hon. William E. Chandler, secretary of the navy under President Arthur and senator from New Hampshire from 1887 to 1901. Mr. Chandler sought reelection, but was defeated by Mr. Burnham in the Republican caucus in the Assembly. President McKinley appointed him later president of the Spanish Claims Commission (see UNITED STATES, paragraph Spanish Claims Commission).

State Officers.—Governor, Chester B. Jordan, Republican, term expires January, 1903; secretary of state, Edward N. Pearson; treasurer, Solon A. Carter; attorney-general, Edwin G. Eastman; superintendent of education, Channing Folsom; secretary of agriculture, Nathune J. Bachelder; commissioner of insurance, John C. Linehan, three years, ending October, 1902. Supreme Court: Chief justice, holding office until March 6, 1908, Isaac N. Blodgett, Dem.; associate justices, Frank N. Parsons, Rep.; William M. Chase, Dem.; Reuben E. Walker, Rep.; and James W. Remick, Rep.

Congressional Representatives (57th Congress). In the House—Cyrus A. Sulloway, from Manchester, and Frank D. Currier, from Canaan—both Republicans. In the Senate—Jacob H. Gallinger (until 1903), from Concord, and Henry E. Burnham (until 1907), from Manchester—both Republicans.

NEW HEBRIDES, a group of islands in the Pacific lying west of Fiji, have an area of about 3,000 square miles and a population of about 100,000. They are administered by a joint commission of French and British naval officers. During 1901 there was some friction between the French and British interests. Early in the year it was reported that the French colonists were seriously encroaching upon the lands of the natives; only a prompt restraint of these aggressions, it was said, would prevent the French from practically absorbing the two central islands. In the summer announcement was made that France had determined to establish a naval station

in the southern Pacific and to increase its squadron in those waters. Such action would probably be prejudicial to British interests. In general the natives favor the British, and in 1901 the inhabitants of the island of Efi appealed for British annexation.

In 1901 the Rev. Dr. J. G. Paton, who for forty-two years had been a missionary to the New Hebrides, reported in London that there were in the islands 18,000 converts, all of whom were faithful in attempting to extend Christianity. When Dr. Paton began his work the population consisted of the most degraded kind of unclothed and cannibal savages.

NEW JERSEY, a Middle Atlantic State of the United States, has an area of 7,815 square miles. New Jersey was one of the original thirteen States. The capital is Trenton. The population in 1900 was 1,883,669, while in June, 1901, as estimated by the government actuary, it was 1,932,000. The populations of the five largest cities in 1900 were: Newark, 246,070; Jersey City, 206,433; Paterson, 105,171; Camden, 75,935; and Trenton, 73,307.

Finances.—At the beginning of the fiscal year, ending October 31, 1901, the balance in the treasury was \$2,084,661.86. The receipts during the year were \$7,502,828.02, making a total of \$9,587,489.88. The disbursements for the fiscal year were \$7,121,969.72, leaving on October 31, a balance on hand of \$2,465,520.16. The last of the State war bonds, whose issue was approved April 14, 1864, amounting to \$71,000, fall due on January 1, 1902.

Industries.—From preliminary reports of the industries of New Jersey made public by the census bureau, it appears that the total capital invested in that State in mercantile and mechanical industries has nearly doubled within the decade. In 1890 this capital, exclusive of capital stock, amounted to \$250,805,745, while in 1900 it amounted to \$502,824,082. At the same time the number of mechanical establishments had increased from 9,225 to 15,481. The capital invested in 1900 in mechanical industries was divided as follows: In land, \$42,539,846; in buildings, \$76,227,514; in machinery and implements, \$135,371,296; and in cash and sundries, \$248,685,426. The total number of salaried persons in 1900 was 16,283, drawing salaries of \$19,688,946. The total number of wage-earners in mechanical and manufacturing industries in 1900 was 241,582, drawing wages amounting to \$110,088,605. This was a large increase from 1890, when there were 173,778 wage-earners, drawing wages amounting to \$82,944,118. Of the wage-earners in 1900, 181,879 were men, drawing wages of \$94,463,105; 51,661 were women, drawing salaries of \$14,281,265; and 8,042 were children under 16, drawing wages of \$1,344,235. The value of the products of all manufacturing industries was \$611,748,933, as against \$354,573,571 in 1900. The cost of materials used in 1900 was \$360,945,843, and miscellaneous expenses amounted to \$42,654,076. In 1900 New Jersey was sixteenth of the States of the Union in population, and in 1890 it was eighteenth; but in both decades it has been sixth in rank in the importance of its manufacturing industries.

Legislation.—The following are some of the most important acts passed by the legislature: Providing that liquor licenses in cities of 2,000 to 9,000 be granted by the county court of common pleas; exceptions. Abolishing the present State board of education and providing for the appointment of a new board by the governor; the board to consist of 16 members, and hold office for 5 years. Permitting cities to issue bonds for libraries to the amount of 5 mills on \$1.00 of the assessed valuation in excess of the limit, and increasing the tax that may be levied for the support of free public libraries from one-third to one-half mill on \$1.00 of the assessed valuation. Exempting from taxation buildings which are used entirely for purposes called charitable under the common law. Permitting married women to convey life estate without the husband joining. Authorizing the chancellor to appoint two vice-chancellors who have had ten years' experience as attorneys. Requiring that three terms of the court of common pleas be held in each county. Giving the mayor the power to appoint the police justice in cities under 12,000. Requiring that upon the written notification of the governor, attorney-general, judge, or prosecutor that the crimes act is being violated, the municipality must take action. Providing that city elections be held on the first Tuesday after the first Monday in November annually; and that the officers be voted for on ballots required for the State and county officers. Classifying cities; over 150,000, 1st class; 12,000 to 150,000, 2d class; all others, 3d class. Providing that on petition of 100 voters, the governor may appoint a commission of three voters of the city, not of the same political party, to divide the city into wards; the supreme court may review this decision. Authorizing the election of four park commissioners in each county to hold office for two years, and having power to locate and acquire parks and condemn lands. Permitting counties having no public hospital to appropriate \$15,000 for building or enlarging private hospitals. Giving charitable, religious, and educational corporations the right to hold and convey property in trust. Defaulting tenants may be removed (formerly remarkable only if satisfaction could not be had by distress of goods); district courts

of cities have jurisdiction. Revising game law; game birds and small game are not to be taken except with gun; wild birds are not to be killed nor their nests destroyed; exceptions; close season for game; regulations for hunting water-fowl; fishing regulations.

Elections.—On January 22, 1901, the legislature elected William J. Sewell, Republican, United States Senator from 1881-87, and again from 1895-1901, to succeed himself for the full term ending March 4, 1907. Mr. Sewell was the unanimous candidate of the Republican caucus, and every Republican member of the legislature cast his vote for him. The total vote in the legislature was as follows: In the Senate: W. J. Sewell, 17, and Alva H. Clark (Dem.), 4; in the House: Sewell, 45; Clark, 13; not voting, 2.

State Officers.—Elected in 1901, taking office on January 1, 1902, and serving three years: Governor, Franklin Murphy, Republican; secretary of state, term five years, expiring April 1, 1902, George Wurts; treasurer, term three years, expiring April, 1903, George B. Swain; comptroller, term three years, expiring April, 1903, William S. Hancock; attorney-general, term five years, expiring April, 1902, Samuel H. Grey; superintendent of education, term three years, ending April, 1903, Charles J. Baxter; commissioner of insurance, term three years, ending April, 1903, William Bettie. Supreme Court: Chief justice, William S. Gummere, Rep., term expires in 1908; associate justices, John Franklin Fort, Rep.; Jonathan Dixon, Rep.; Bennett Van Syckel, Dem.; Charles G. Garrison, Dem.; Abram Q. Garretson, Dem., and Mahlon Pitney, Rep.

Congressional Representatives (57th Congress). In the House—Henry C. Loudenslager, from Paulsboro; John J. Gardner, from Atlantic City; Benjamin F. Howell, from New Brunswick; Joshua S. Salmon, from Boonton; James F. Stewart, from Paterson; R. Wayne Parker, from Newark; Allan L. McDermott, from Jersey City; and Charles N. Fowler, from Elizabeth—all Republicans, except Benjamin F. Howell and A. L. McDermott, Democrats. In the Senate—John Kean (until 1905), Republican, from Elizabeth; William J. Sewell, Republican, from Camden, who had been elected to succeed himself for the term ending March 4, 1907, died December 27, 1901 (see SEWELL, WILLIAM J.), leaving a vacancy to be filled by the legislature which meets in January, 1902.

NEW JERUSALEM, CHURCH OF THE. The adherents of this church, more widely known as Swedenborgians, a name derived from that of their leader, formed their first church in the United States in 1792; but, as an organization, date their existence from the year 1817, when the General Convention was established. The Swedenborgians are included in two bodies: *The General Convention of the New Jerusalem in the United States of America* and *The General Church of the New Jerusalem*. The former division has 6,814 communicant members, and 108 societies, and 113 ministers. It maintains Urbana University at Urbana, O.; the Waltham New Church School at Waltham, Mass.; and a theological seminary at Cambridge, Mass., where it has property and endowment amounting to \$140,000. The General Convention issues, among other periodicals, *The New-Church Messenger* (weekly), at Orange, N. J., and *The Helper*, at Philadelphia, Pa., with circulations approximating 2,300 and 3,200 respectively, and controls two trust funds, the Rotch (\$20,000) and the Lungerich (\$40,000), devoted, the former to the publication of Emanuel Swedenborg's writings and the latter to the free circulation of his important works, *The True Christian Religion* and *The Apocalypse Revealed*, to ministers and theological students. President of the General Convention, Rev. Samuel S. Seward; secretary, Rev. William H. Alden, 2129 Chestnut Street, Philadelphia.

The General Church of the New Jerusalem.—This body, in 1897, became an independent branch of the New Church, and now includes about 600 members, 17 societies and circles, and 22 ministers, its adherents being found in Great Britain and Canada, as well as in the United States, where lies their great strength. It is distinguished by an episcopal polity and by special zeal in the work of religious education. In addition to 5 parish schools with 120 students, the General Church has an incorporated academy, founded in 1876, at Huntingdon Valley, Pa., the headquarters of the church. The institution includes a theological school, and colleges for boys and girls, this work being superintended by the bishop of the church, the Rev. William F. Pendleton. The year 1901 was made notable by the erection of a commodious new school building with two dormitories. *The Journal of Education* is published as the official organ of the academy, and *New Church Life* (monthly), edited by the Rev. Th. Odhner, who is also secretary of the General Church of the New Jerusalem, represents the general interests of the denomination.

NEW MEXICO, a southwestern Territory of the United States, has an area of 122,469 square miles. New Mexico was organized December 13, 1850. The capital is Santa Fé. The population in 1900 was 195,310, while in June, 1901, as estimated by the government actuary, it was 199,000. The largest city in 1900 was Albuquerque

with a population of 6,238. The total population of the Territory as shown by the census returns is, however, by no means accepted by the governor, who states that in October, 1900, there were 59,297 registered voters in New Mexico, and that, allowing for five persons to one voter, a moderate estimate, the total population cannot be less than 296,000, an excess of 100,000 over that allowed by the census estimates.

Finance.—On December 2, 1900, the cash held in the treasury amounted to \$109,974.31. For the following year, ending December 2, 1901, the receipts were \$540,795.76 and the expenditures were \$465,815.62, leaving in the treasury \$184,954.45. The debt at the end of the year was \$1,180,600, all of which was bonded. During the year the principal on the debt was paid to the amount of \$24,500. The tax rate for the year was 14.5 mills and the total value of property returned for taxation was \$36,364,761.16, which represented, as stated by the governor, not more than one-fourth of the actual value of all property in the Territory.

Industries.—Although the census reports of 1900 indicate a large percentage of increase in the manufacturing interests of New Mexico since 1870, the aggregate value of the products is small. The territory is primarily a mining and stock-raising area with agriculture next in importance, and mechanical industries limited to those relating essentially to the building up of new countries. During the thirty years ending with 1900, the average number of industrial wage-earners increased from 427 to 2,600. In the latter year, the amount of actual capital, exclusive of capital stock, invested in 420 establishments reporting, was \$2,698,786, and the gross value of the products, inclusive of materials re-used in the process of manufacture, was \$5,605,795. The most important industries are car construction and repair-shop work, smelting and refining of copper and lead, carpentering, making of lumber and timber products, and flour and grist milling. New Mexico has a larger number of sheep than any other State or Territory, and the recent establishment of four wool-scouring plants within the Territory is proving of great advantage to sheep farmers.

Legislation.—Among the acts passed by the New Mexico legislature in 1901 were the following: A Territorial board of health was created, consisting of seven members, whose duty it is to grant certificates to practice medicine to those who are graduates of an accredited school of medicine, or to those who pass examinations satisfactory to the board. Persons not holding these certificates are prohibited from practicing medicine; and the practice of medicine is construed in the act to include the treatment of any physical or mental ailment, and the recommending or prescribing of any curative drug, appliance, or agency, "whether material or not material," and receiving compensation or pay for the same. This law would apparently act to debar both osteopaths and Christian Scientists from practicing their professions. An act for the protection of children in schools, provides that no teacher shall be engaged and no one teaching shall continue to teach who has tuberculosis. Before any teacher is engaged he is subject to a medical examination, and any teacher at present engaged is subject to a like examination. Another act provides that if any teacher debars a child from attending school on account of race or nationality, the teacher shall be discharged and shall be forever prohibited from teaching or holding any office of honor or profit in the Territory. Foreign railway corporations owning lines in New Mexico are authorized to extend them and to build branches and to exercise for that purpose the right of eminent domain. All foreign and domestic corporations are required, before doing business in the Territory, to publish their articles of incorporation, and in the case of a foreign corporation, to appoint an agent upon whom process may be served. An act similar to one passed by Louisiana and declared constitutional by the United States Supreme Court in 1900, forbids houses of prostitution to be opened within 700 feet of any school, church, or other place of public assemblage. Outside of this limit, such resorts are to be suppressed or regulated by the municipal authorities. On the test case which came before the Supreme Court in 1900 with regard to the Louisiana statute, it was claimed by various property holders that these resorts depreciated the value of their property, and that such property was being taken from them "without due process of law." The Supreme Court held, however, that the regulation of such resorts came properly within the police powers of the State, and that an incidental loss of property resulting therefrom could not be taken to invalidate the law. Other acts of the legislature are discussed in subsequent paragraphs.

Gila River Forest Reserve.—A memorial addressed by the legislature to the President of the United States stated that the Gila River Forest Reserve was established in western Socorro County by executive proclamation March 2, 1898, without the prior knowledge of the thousands of people within its boundaries; that the reserve was nearly as large as New Jersey and included within its outer boundaries extensive non-forest lands, valuable only for mining, agricultural, and grazing purposes, besides eight towns and villages in the interior of the reserve, a large number of farms and stock ranches, and two of the most prominent mineral sections in the entire southwest, that is, the Cooney and Wilcox mining districts. On these mining

interests alone, it was asserted, more than \$5,000,000 have been recently expended. Because of the rules and regulations governing forest reserves, and, on the other hand, because of the necessity of having timber for the mines, the mines in the reservation would greatly depreciate or become worthless. The establishment of the reserve, then, would amount to a confiscation of the homes and ranches of the people there residing. Since all the really valuable forest land, including the entire headwaters and catchment area of the Gila River might be made into a reserve without affecting or hurting the interests mentioned above, the President was urgently requested to order a new delimitation of the forest reserve.

Mining.—The mining industry of the Territory was carried on actively during 1901. Much attention was given to oil lands, and it was thought that many valuable oil-producing districts had been discovered in the area embraced by eastern McKinley County, western Bernalillo County, and a large part of San Juan County. The output of coal for the fiscal year 1900 was valued at \$1,606,174, and the coke production at \$117,516.25. According to official statistics, the percentage of increase of the coal production of New Mexico is greater than the percentage of increase of the United States or of Colorado or Wyoming. The output of gold, silver, lead, and copper for the year was valued at about \$6,000,000. Continuous shipments of iron ore were made throughout the year from points in New Mexico to the Bessemer steel plant in Colorado, but no record was obtainable of the total amount sent. Against the mining bill pending in Congress, introduced by Senator William M. Stewart, the legislature of New Mexico strongly protested in a memorial to Congress. This bill, following closely the urgent recommendations of Governor Brady, of Alaska, provides in effect that no person shall locate more than one placer-mining claim in the same mining district of a stream, nor shall any person locate more than one claim in a vein or lode; nor shall a person locate a claim by power of attorney until after the actual discovery of ore, and then the person for whose benefit the claim is made shall be a citizen of the United States; that on all located mining claims, the assessment work required by law shall be performed on or before the 31st of December following the date of location, and "no person shall relocate, either by himself or by agent, any claim upon which he has failed to perform the said assessment work." The legislature of New Mexico, while admitting that under the present laws, mining speculators could acquire and hold mineral lands to the exclusion of legitimate miners, considered, nevertheless, that the pending bill in Congress would retard the development of the mineral lands of New Mexico and the entrance of capital for mining development. And in lieu of the bill the New Mexico legislature recommended that a bill should be passed prescribing that whenever the locator of a claim did not perform the assessment work required by law within ninety days, he should forfeit his claim, provided, however, that he might relocate there six months after, if his claim had not in the meantime been preempted.

Irrigation.—Considerable progress was made during 1901 in preparing for the irrigation of the arid lands. In March, the legislature, acting in accordance with a federal law of 1898, by which 500,000 acres of the public domain were given to the Territory on condition that such land be irrigated, passed an act creating a Territorial commission of irrigation and vesting it with power to select sites for permanent reservoirs, to advise the United States commission for the selection of the donated lands, as to the location of tracts of said lands which might be irrigated by means of permanent reservoirs, and to approve contracts to be made by the commissioner of public lands for the establishment of such irrigation enterprises. By the same Territorial act, it was provided that contracts might be made by the commissioner of public lands, giving to the corporation constructing the irrigation reservoirs a portion of the proceeds of the sale of the lands donated by the federal government. In accordance with this act, a contract was awarded for the reclamation of 50,000 acres of arid land, applications were pending before the commission at the end of the year for the reclamation of 145,000 more acres, and the commission stated its belief that application would also be made for the reclamation of the remaining land of the original 500,000 acres.

Statehood.—In his annual report for 1901, the governor of the Territory again made a strong plea to Congress for the admission of New Mexico as a State. The governor stated that there was over \$150,000 worth of taxable property in the Territory; that the population numbered 250,000; that the Territory had invested more money in schools per capita than had any other Territory or State; that it had more churches and newspapers per capita than any State; that Statehood had been promised New Mexico in the platforms of great political parties, both national and territorial, and that more than twelve Congresses had investigated New Mexico's claims and reported favorably upon them; furthermore, the governor cited the fact that in the treaty of peace concluded between the United States and Mexico, February 2, 1848, it was provided that the Territory then acquired by the United States should be incorporated in the Union at the proper time and be accorded all the

rights of United States citizenship according to the principles of the constitution. In 1850 New Mexico adopted a constitution and its admission as a State at that time, was only prevented by the adoption of the celebrated compromise measure of that year. In 1878 a bill to admit it to Statehood passed both houses of Congress, but did not become law. In view of the fact that many other Territories with much smaller population and much less wealth, both absolutely and per capita, have since been admitted, New Mexico believes that the discrimination made against it is most unjust. The New Mexico legislature also addressed a memorial to Congress at its session in 1901 to the same effect.

Territorial Officers.—Appointed by the President: Governor, Miguel A. Otero, Republican; secretary, J. W. Reynolds; treasurer, J. H. Vaughn; auditor, W. G. Sargent; land commissioner, A. A. Keen. Supreme Court: Chief justice, William J. Mills; associate justices, John R. McFie, Frank W. Parker, Daniel H. McMillan, and J. W. Crumpacker (in 1901), and Benjamin S. Baker (in 1902)—all Republicans.

NEW SOUTH WALES, a southeastern state of the Commonwealth of Australia. Capital, Sydney, with a population of 111,801 in 1901.

Area, Population, and Education.—The area of the state is estimated at 310,700 square miles. The population, according to the census of 1901, was 1,362,232, against 1,132,234 in 1891, showing an increase of a little over 20 per cent., against 51 per cent. for the preceding decade. The Church of England has over 500,000 adherents, and the Roman Catholic Church about 300,000. Education is controlled by the state and is compulsory between the ages of 6 and 14. In 1900, there were 2,745 state schools, with a total enrollment of 238,382. The private schools and colleges numbered in the same year 912, with a total enrollment of 60,327. The total amount expended by the state on education in 1900 was £873,824.

Government and Finance.—The constitution of the state has not been affected essentially by the establishment of the Commonwealth. At the head of the administration of the state is the governor appointed by the crown and assisted by a cabinet of ten members. The legislative power is invested in a parliament consisting of the legislative council and the legislative assembly. The former numbered at the end of 1900, 75 members appointed for life; the latter consists of 125 members elected by universal suffrage. The net revenues of the state for the fiscal year 1900 amounted to £9,973,736 (£9,572,912 in 1899), of which £2,617,313 were derived from taxation, £2,108,433 from land revenue, and £5,031,709 from public works. The net expenditure for the same year was £9,811,402 (£9,553,237 in 1899), of which £2,803,747 represented expenditures on railways, posts, and telegraphs, £2,310,271 interest on public debt, and £3,970,859 on other public works and services. The public debt of the state amounted at the end of the fiscal year 1900 to £65,332,993, at 3.63 per cent. interest. About 80 per cent. of the public debt represented investments yielding an income of 3.45 per cent. in 1900. The estimated revenue and expenditure for 1901 were £10,794,233 and £10,176,761 respectively. The expenditures from loans for that year was estimated at £2,879,727.

Industries, Commerce, etc.—The total area under crops in 1901 was 2,445,564 acres, and the yield of the chief crops was over 16,000,000 bushels of wheat (about 13,600,000 bushels in 1900), about 6,300,000 bushels of corn, and about 200,000 tons of sugar cane, besides potatoes, barley, oats, tobacco, and oranges. The live stock of the state consisted at the end of the calendar year 1900 of over 36,000,000 sheep, 1,967,000 cattle, 482,200 horses, and 239,973 hogs. The number of persons engaged in agricultural and pastoral pursuits in 1900 was over 122,000. The mineral output for 1900 was valued at about £6,500,000, showing an increase of more than £400,000 over the preceding year. The output of the chief minerals was: Gold, £1,194,521 (£1,751,815 in 1899); silver, lead, and zinc, £2,781,450 (£2,229,653 in 1899); coal, 5,500,000 tons (4,600,000 tons in 1899). The number of persons employed in the mines in 1900 was 43,745. The number of manufacturing establishments and works in 1900 was 3,077 (exclusive of small establishments), employing 60,779 hands (50,516 males and 10,263 females). The exports for 1899 amounted to £28,445,466 (£27,648,117 in 1898) and consisted of wool, £11,738,607; coal, £1,005,794; hides and skins, £1,035,905; meat and other animal products, £1,539,225; and gold coin, £3,489,286. The participation of different countries in the exports of the state in 1899 was as follows: Australasian colonies, £9,524,267; Great Britain, £8,992,480; and the United States, £2,392,281. The imports for 1899 amounted to £25,594,315, of which the Australasian colonies contributed £12,113,402; Great Britain, £8,211,351; and the United States, £2,219,319. In 1900 the imports and exports amounted to £27,561,071 and £28,164,516 respectively. At the end of the fiscal year 1901 the state had in operation 2,845 miles of government railway lines (2,771 in 1900) and 84 miles of private lines. The total amount spent on the government lines up to June 30, 1901, was £38,932,781. The government tramway lines had at that date a total length of 79 miles and the private lines, 6¼ miles. The telegraph lines had a total length of 14,065 miles.

History.—In consequence of the resignation of the premier, Sir William Lyne, to

take a seat in the federal cabinet, the ministry was reorganized on April 10, 1901, with Hon. John See as premier. A week later Mr. See announced that the policy of the new government, which was Progressive in its party affiliations, would favor a referendum for the revision of the constitution and a reduction in the size of the state legislature, the establishment of a new system of local government, industrial arbitration, old-age pensions, and female suffrage. The state elections of July 3 gave the See cabinet a new title to office. The elections resulted in the return to Parliament of 41 Ministerialists (Progressives), 41 Opposition (Liberals), 27 Labor members, and 16 Independents. The See ministry, however, had a natural alliance with the Labor party, and a number of Independents were favorable to it. On July 1, Sir William Lynes's old-age pension act went into effect. The act is more radical than that of New Zealand, providing pensions of 10 instead of 7 shillings, and reducing the age limit to 60 years. The possession of a small income is not to be considered a disqualification. With the plan in full operation it was estimated that the annual cost to the state would be between £400,000 and £500,000.

In September a motion of want of confidence, proposed by the opposition, was defeated by a combination of Ministerialists and Labor votes by 66 to 28. In the same month the government's bill providing for woman suffrage was defeated in the upper house by a vote of 26 to 21. Early in December a compulsory arbitration bill, that had once before been defeated in the council, passed both houses.

NEW YORK, a Middle Atlantic State of the United States, and one of the original thirteen, has an area of 49,170 square miles. The capital is Albany. The population in 1900 was 7,268,012, while in June, 1901, as estimated by the government actuary, it was 7,406,000. The populations of the largest cities in 1900 were: New York (the largest city in the United States), 3,437,202; Buffalo, 352,387; Rochester, 162,608; Syracuse, 108,374; Albany, 94,157; Troy, 60,651, and Utica, 56,383.

Finances.—At the beginning of the fiscal year ended September 30, 1901, the balance in the treasury was \$7,289,802.55. The receipts for the year amounted to \$30,544,694.88, making a total of \$37,834,497.43. The expenditures were \$28,045,146.27, leaving a balance in the treasury October 1, 1901, of \$9,789,351.16, made up as follows: General fund, \$8,291,174.32; canal fund, \$883,247.27; free school fund, \$398,965.24; United States deposit and miscellaneous funds, \$215,964.03.

Industries.—From preliminary reports made by the census bureau of the industries of New York, it appears that the total capital, exclusive of capital stock, invested in the manufacturing and mercantile establishments of the State was \$1,679,906,515 in 1900, as against \$1,130,160,195 in 1890, thus showing an increase of 48.6 per cent. The total gross value of industrial products in 1900, inclusive of the products re-used in the process of manufacture, was \$2,175,766,900. In 1890 the total value of products was \$1,711,577,671. There was thus an increase in the decade, in the value of products, of 27.1 per cent. Of the total capital invested in the industrial enterprises in 1900, \$175,260,215 was invested in land, \$217,011,426 in buildings, \$387,421,432 in machinery and implements, and \$900,213,442 in cash and sundries. At the same time the total number of salaried persons was 74,482, drawing annual salaries of \$82,077,648. This shows a large decrease since 1890 both in the number of salaried persons and in the amount of salaries, the figures in 1890 being 98,018 persons, with salaries of \$96,466,083. It will be noted that the number of salaried persons has decreased in larger proportion than the decrease in total salaries expended. In 1900 the total number of wage-earners was 849,092, drawing wages of \$408,864,952. These figures represent a large increase from 1890, when there were 752,066 wage-earners, drawing wages of \$370,380,559. Of the total number of wage-earners in 1900, 605,694 were men, drawing wages of \$338,033,234; 230,199 were women, drawing wages of \$68,628,388; and 13,199 were children under 16, drawing wages of \$2,302,330. Much more than one-half of the entire industrial business of the State is carried on in Greater New York, the capital invested there in mercantile industries being \$922,125,581, the gross value of the products being \$1,371,396,468. As compared with 1890, this shows an increase in capital invested of 48 per cent., and an increase in the value of products of 26.4 per cent. Outside of Greater New York, Buffalo is the largest manufacturing city. In 1900 the capital invested in manufacturing there was \$103,939,655, while the gross value of the products was \$122,230,061. These figures represent an increase of 47 per cent. of capital invested since 1890, and an increase in the value of products of 22.2 per cent. Rochester follows Buffalo in the value of its industries, the capital invested in 1900 being \$49,086,212, and the gross value of the products \$69,129,820. The increase in capital invested since 1890 was 6 per cent., and the increased value of products 6.2 per cent. Syracuse had, in 1900, capital invested in manufacturing industries to the amount of \$31,358,055, and products valued at \$31,948,055. The increase in the capital invested was 37.2 per cent., and the increase in the value of the products 9 per cent. The capital invested in mercantile industries in Troy in 1900 was \$51,978,417, representing an increase since 1890 of 116.3 per cent. At the same time the gross value of the products was \$28,209,259, or a decrease

since 1890 of 3.6 per cent. The disparity here between the increased capital invested and the stationary, or, rather, diminishing, value of the products is very great.

Legislation.—The following are some of the more important acts passed by the legislature: Abolishing common-law marriages; written contract required, signed by the parties to the marriage in the presence of two subscribing witnesses; that this contract shall be acknowledged by the parties and the witnesses in the same manner as a contract or transfer of real estate; contract to be filed within six months with town or city clerk; marriages not invalid for want of authority of officer solemnizing or for clerical errors. Providing that liquor shall not be sold within one-fourth mile of polling place, nor while polls are open; persons attempting bribery or betting, and those convicted of felony, not to vote; flag not to be used as emblem on ticket. Admitting qualified women taxpayers in villages to vote on proposition to raise money. Amending '96, ch. 909, § 11, as to appointment of election inspectors in towns; town board to appoint 2 from each party; term 2 years. Consolidating labor departments; abolishing offices of commissioner of labor statistics, factory inspector, and board of mediation and arbitration; governor and senate to appoint commissioner of labor; commissioner to appoint 2 deputies. Requiring that the law concerning factory inspection, employment in factories, and tenement-made articles, to be posted in every workroom; public laundries to be visited by factory inspector; work not to be done in sleeping or living room; exceptions. Requiring that 2 members of the board of directors of a corporation must be residents of the State. Limiting the amount of loans of a trust company to a director to one-tenth of the capital stock; the loan requiring the consent of a majority of the directors. Providing for a tax levy of 1 per cent. on the par value of surplus and undivided earnings of savings banks. Providing for a tax levy of 1 per cent. on capital stock, surplus, and undivided profits of trust companies. Providing for a tax levy of 1 per cent. on bank shares; amount of share determined by adding capital, undivided profits, and surplus and dividing by the number of shares; no deduction for indebtedness. Providing that after 25 years from the date of a gift or a bequest for religious, charitable, or educational purposes, the supreme court may administer property without regard to the directions of the donor. Exempting from jury duty editors, editorial writers, and daily newspaper reporters. Changing the color of the State flag from buff to blue. Requiring that an elector or his wife must own property in a town in order to vote on a proposition to raise over \$500. Providing that villages under 2,000 may elect 2 or 4 trustees. Providing that highway commissioners of towns with improved roads shall care for the same under the direction of the State engineer. Authorizing the board of supervisors to limit the speed of automobiles to 8 miles an hour in built-up districts, and 15 miles an hour in other districts; owner of the automobile must register with the secretary of state. Prisoners serving sentence in the State prison for felony may be paroled if the maximum sentence is not over 5 years; on the first conviction of felony the offender must be sentenced to the State prison under indeterminate sentence. Courts having original jurisdiction of criminal cases are to appoint probation officers to investigate antecedents and character of prisoners over 16; sentence may be suspended and the prisoner placed in custody of a probation officer. Abolishing State board of health and devolving the duties on the commissioner appointed by the governor and the senate; the commissioner is given power to inquire into the cause of disease, to investigate the effect of localities, employments, and other conditions affecting the public health, and he may modify or reverse the orders of local boards of health. Providing \$100,000 for the buildings and the equipment of a pulmonary tuberculosis hospital; the site of the hospital to be selected by the governor, president *pro tempore* of the senate, and the speaker of the assembly. A new tenement-house act, containing minute regulations concerning tenement houses in cities of 250,000 inhabitants; introducing a number of radical changes in the air shaft, etc., to secure better light and ventilation, and greater freedom from fires. (See TENEMENTS.) Consolidating forest, fish, and game commission and forest preserve board; the commission to consist of a commissioner, appointed by the governor and the senate; after January 1, 1903, the commissioner is to appoint a deputy.

Charter Revision.—Owing to the continuous criticisms passed upon the practical efficiency of the charter of the city of Greater New York which went into effect in 1897, Governor Roosevelt in 1900 appointed a committee of fifteen to make a tentative revision of the charter and to submit their findings to the governor. On December 1, 1900, this committee submitted its report. In this report the commission stated that under the charter of 1897 there had been placed so many checks and safeguards upon the various municipal bodies, and the powers of legislation had been so minutely subdivided, that various amendments were necessary to facilitate local legislation, to simplify the municipal machinery, and to centralize the governing power. Under the old charter there was a double municipal legislative body consisting of a council and a board of aldermen, and this double body furnished great opportunity for legislative obstruction and inefficiency, if not of dishonor, and it was therefore

recommended that the council should be abolished and that the board of aldermen should exercise the powers previously exercised by the legislature. By the charter of 1897, the city was supposedly divided into five administrative boroughs. But owing to the overriding authority in their own departments of the various city boards having jurisdiction throughout the limits of the city, the borough presidents were as a matter of fact practically limited in power to the possession of a seat in the Board of Public Improvements and to membership in the Local Improvement Boards of the boroughs; which local improvement boards, however, had very little authority. Now the crowded East Side of Manhattan Borough and the rural districts of Queens and Richmond Boroughs had such diverse needs as to local improvements that some degree of local autonomy should evidently be given them. And this the commission had provided for by enlarging the powers of the borough presidents. On the other hand, the commission strongly urged that the great departments of public safety should be centralized and placed in strong control; for example, the departments of Finance, Law, Public Charities, Correction, Docks, and Taxes. Another matter considered by the committee, but not favorably acted upon by the legislature, was that of the interference of the legislature in purely local matters (see paragraph Municipal Campaign). The committee stated in this respect that they deprecated the continuous mandatory laws of the legislature affecting city matters, and while they were not prepared to recommend so radical a change as the passing of a constitutional amendment prohibiting the legislature from passing any municipal acts not equally applicable to all the cities of the State, they did suggest that the legislature should hereafter refuse to consider bills of a local nature with which the cities themselves were competent to deal.

In accordance with the main recommendations of the committee, the legislature on April 4, 1901, passed a bill revising the New York charter. While sundry amendments to the committee's recommendations were introduced for party's sake, the bill as a whole was generally commended on the ground that it gave recommendations to principles shown by experience to be necessary to efficient municipal government. The chief of these principles as recognized in the charter were, first, that the mayor should possess large powers and corresponding responsibility through his right to appoint the heads of executive departments and to remove them at any time; second, the executive departments were to be single-headed, instead of bipartisan as previously; third, the municipal assembly or legislative body was to be one and not two chambered.

Provisions of the Act.—Under the new charter, the mass of the city's governing power is centralized in a Board of Estimate and Apportionment, consisting of eight officials elected for the term of two years and eligible for reelection. This board is made in effect both an upper house of the city's legislature and a cabinet of the most important administrative officers. The eight officers constituting the board are the mayor, the presidents of the five boroughs into which New York is divided, the comptroller, and the president of the Board of Aldermen. Each of these has large individual authority outside of their power in the board; the first five, over the extensive improvements carried on in their boroughs; the president of the Board of Aldermen, over legislation and ordinances, and the comptroller, over city finance. In this board, whose sanction is necessary to every bond issue and every appropriation of money, the mayor, comptroller and the president of the Board of Aldermen have three votes each; the presidents of the boroughs of Manhattan and Brooklyn, two votes each, and the other three borough presidents, one vote each. The mayor is given, as under the charter of 1897, the power of appointment of the heads of all the great city departments; but under the charter of 1901, he is also given the power to remove these appointed officials at will, whereas under the old charter, he could only remove them during the first six months of his term. In other words, the mayor is now made responsible throughout his term of two years for the conduct of all the important executive officials of the city. Under the new charter, the Board of Public Improvements was abolished. This board consisted of the mayor, the corporation counsel, the comptroller, the presidents of the several boroughs, and the heads of such departments as those of highways, water supplies, buildings, etc. A favorable vote by this board was one of the prerequisites for obtaining local improvements for the boroughs in any of the matters under the administration of the commissioners who had seats in the board. And this brought about an involved and often a log-rolling process, especially as the approval of the municipal assembly was also required. Under the new charter, the powers of the Board of Public Improvements are given mainly to the borough presidents, and the residue to the Board of Estimate and Apportionment. The departments of highways, sewers, buildings, public buildings, lighting, and supplies have been decentralized and each borough president is vested with administrative powers in these matters in his own borough. Under the old charter, there were various local improvement boards in each borough; but as these boards could only recommend improvements, they subserved small purpose, and proceedings for improvements were generally

taken by citizens to the central Board of Public Improvements, which body was more concerned with the geographical location of the desired improvements and the political aspect of the improvements than with their necessity. By the new charter, local improvements may be immediately begun upon the approval of the local boards, the borough president and of the Board of Estimate, of which the borough president is a member. The council of the municipal assembly was abolished, and instead there was instituted a single Board of Aldermen, consisting of seventy-three members chosen from the aldermanic districts of New York, the president of the Board of Aldermen chosen on a general ticket, and the presidents of the boroughs. Under the old charter, the municipal assembly had practically no power except to do routine work, and the great administrative departments were practically independent of it. By the new charter, the assembly is given much larger power, and in order to make it a real representative body which may be held responsible to the people, the heads of departments are required to make answer to the assembly of all inquiries made by it into the affairs of their departments. Most of the administrative departments are to be governed by single heads instead of commissioners; notably, the Police Department, the Department of Docks, Board of Health, and the Board of Public Charities. The powers formerly exercised by the Board of Health over tenement houses have been transferred to a newly created Tenement House Department (see article TENEMENTS), administered by a Tenement House Commission, and to this department is committed the duty of enforcing the provisions of the new Tenement House Act passed by the legislature in 1901. Many important changes are made in the composition, duties, and powers of the Board of Education. (See the article EDUCATION in THE UNITED STATES, paragraph General Progress of the Year.) Under the old charter, the heads of the administrative departments were enabled to fix the salaries and tenure of office of their employees. By the new charter, this power is absolutely taken away from them and the pay of all the city employees is to be regulated by the Board of Aldermen with the approval of the Board of Estimate and Apportionment. By this change in the method of fixing salaries, it is believed that a large annual saving will accrue to the city; for the old law led to great abuses. The Board of Elections, formerly a portion of the police department, is made a separate body composed of four commissioners appointed by the mayor. Strong recommendations were made by the commission that the Davis law be repealed. This law, enacted in 1900, provided for approximately the same salaries to all teachers of the same grade throughout the city, without regard to the expense of living in the different localities, or the salaries which had been before given. In many cases it resulted in doubling salaries, and it increased the cost to the Department of Education yearly by nearly three million dollars. The law, however, was retained in force.

Ice Trust.—On October 2, 1901, the Court of Appeals granted the American Ice Company a writ of error to the Supreme Court of the United States. By this writ, the case of the American Ice Company was removed from the jurisdiction of the State, and all further proceedings against the company in New York were barred pending a decision of the court at Washington. The American Ice Company was organized in 1899 with a capitalization of \$36,945,100, and among its prominent stockholders were the Hon. Robert A. Van Wyck, mayor of New York, Mr. Richard Croker, and other men prominently connected with the management of municipal affairs. In April, 1900, indignation against the company was everywhere aroused by its attempt to put up the price of ice to 60 cents per hundred pounds, an increase of a hundred per cent. over the market rate. This increase was defended by the company on the ground that there had been a shortage of the ice crop of the Hudson the previous winter. At the same time, it was said that the company owned abundant ice in storage and that in any event artificial ice could be sold at a profit of 25 cents per hundred pounds. At the instance of the attorney-general, proceedings were begun against the ice company under the Donnelly anti-trust law of 1897, and in May, 1900, the Supreme Court appointed a referee with power to examine into the affairs of the company. At a special term of the Supreme Court this appointment and order were confirmed; but on November 20, 1900, the Appellate Division reversed the decision and vacated the order. The attorney-general then carried the case to the Court of Appeals, and that court on October 1, 1901, held that the Donnelly law was valid and that the proceedings prescribed by it were also valid. But the court on the following day certified to a writ of error to the Federal Court and the final decision in the matter was thus put off for probably two years longer. In the meantime the company had reduced the price of ice, both as a concession to public opinion and because several opposition companies had been organized.

Street Railway Strike.—On May 6 a strike was declared against the trolley lines of Albany, Troy, Cohoes, and Rensselaer, operated by the United Traction Company, of Albany. The cause of the strike, as stated by the company, was the refusal of its managers to discharge eight or nine non-union employees; according to members of the union the trouble was caused by the refusal of the company officially to recognize

the union, or to allow it to organize all the employees of the company. On May 14 with some 200 "imported" non-union men, the company endeavored to operate its cars; riot ensued and the Twenty-third Regiment, of Brooklyn, was called to the scene. On May 18, after considerable brawling, stone-throwing, and a lesser amount of rifle and pistol shooting had been indulged in, a compromise agreement was signed by the company and the union, whose terms, if they set a precedent for similar strikes elsewhere, would, it was said, more than compensate for the cost of the strike in the interruption of traffic and the calling out of the militia. The company on its side agreed to pay extra men and night men an even rate of twenty cents an hour; to recognize and treat with any committee of its employees, representing organized or unorganized labor, in relation to grievances; to grant to any man, suspended or discharged by the superintendent, the right to appeal to the executive committee of the company; and to rebate to any suspended employee, when found not guilty of offense by the committee and reinstated, the full amount of his wages during the period of his suspension. On the other hand, the union conceded the right of the company to employ, at its pleasure and without prejudice, either union or non-union men, and the union also agreed that, in the interests of business and of the public generally, no proposition to strike in the future should be acted upon by the union within two days from the time the proposition had been made, nor should such a strike when ordered take effect until at least six days after notice of the declaration of the strike had been given to the company. For an account of other strikes in the United States during the year, where the main issue was, as in this case, the recognition, or more properly speaking the expansion, of union power, see article STRIKES.

New York City Police Department.—On February 22, 1901, the State legislature passed a bill abolishing the bi-partisan board of four police commissioners in New York City, as well as the office of chief of police, and substituting a single commissioner to be appointed by the mayor, but removable by the governor. This bill was the result of an agitation against the methods of the police department in New York, extending back to January 1, 1897, when the Tammany administration was placed in power, but whose acute stage commenced on November 15, 1900, when Dr. Henry C. Potter, Protestant Episcopal Bishop of the Diocese of New York, wrote an open letter to Mayor Van Wyck, complaining of the participation of the police in the processes and proceeds of vice in New York, in terms so scathing as to rivet the attention of all citizens in a way to which they were entirely unaccustomed. Bishop Potter did not ask that crime and vice should be eradicated in the city, or that the police should enforce the laws of the State regarding them. He did ask, however, that the police in the tenement districts throughout the East Side should not habitually license vice, forcing the poorer people of the city, and more especially the tenement children, to be brought in contact with it in its most repulsive phases.

"In the name of these little ones," said Bishop Potter, "these weak and defenseless ones, Christian and Hebrew alike, of many races and tongues, but of homes in which God is feared and His law revered, and virtue and decency honored and exemplified, I call upon you, sir, to save these people, who are in a very real way committed to your charge, from a living hell, defiling, deadly, damning, to which the criminal supineness of the constituted authorities, set for the defense of decency and good order, threatens to doom them."

Following the Bishop's appeal, a committee of five was appointed by Tammany Hall, and also a committee of fifteen by the Chamber of Commerce to investigate the truth of the Bishop's charges. The committee of five were unable to obtain any considerable evidence; but the committee of fifteen encountered no difficulty in raiding a large number of illegal places and in bringing forward indirect proof, formidable in its amount, of the interest of the police in blackmailing schemes of all kinds.

The action of the Republican legislature, coincident with these exposures, in abolishing the bi-partisan board of police commissioners and the office of the chief of police, was answered by the Tammany Democratic organization by the appointment of Michael C. Murphy as police commissioner, and the immediate appointment by him of William S. Devery, former chief of police as first deputy police commissioner. While this action of Tammany was effective in nullifying the action of the legislature, it was, as events proved, unpolitic; for the whole responsibility for the police situation being thus centralized in one person, the press took advantage of it to make the personality of Mr. Devery a main issue in the municipal campaign in the fall. (See paragraph Municipal Campaign.) Whether these attacks upon Mr. Devery and the police department were altogether warranted, so far as they related to the closing of saloons on Sunday, was not entirely clear. See article MUNICIPAL GOVERNMENT (paragraph Excise Question).

Pennsylvania Railroad.—On June 23, 1901, the Brooklyn *Eagle* published an authorized interview, setting forth various plans of the Pennsylvania Railroad with regard to the Long Island Railway, purchased by the Pennsylvania in May, 1900.

Stated briefly, these plans were to utilize the existing tracks, franchises and rights of the Long Island, in order to establish, by the aid of connecting extensions to be built, unbroken traffic from the extreme north and east of the country to the south and west. The main system of connections was outlined as follows: From Greenville, southwest of the Battery on the New Jersey shore, where the Pennsylvania was developing a great freight terminal for its main line, a car ferry, some three miles in length, was to run to Bay Ridge on the Long Island shore. From there passengers and freight would be taken through Brooklyn, as far as St. James Park, over the lines of the Long Island. Then the franchise of the New York Connecting Railroad Company, giving the right to lay lines from St. James Park to the Borough of Bronx, on the mainland, by means of connecting bridges over Ward's and Randall's islands, would be utilized so as to establish the last link of the chain, and place the New York, New Haven and Hartford, and the New York Central Railroads in direct connection with the Pennsylvania. A subsidiary plan, both for developing the traffic of Long Island proper, and for placing Manhattan Island in easy communication with the main through system, was to bore a railroad tunnel from the neighborhood of Thirty-fourth Street, in New York, to Brooklyn, and to erect in Brooklyn a large central passenger and freight station. The Rapid Transit Commission, which has in charge the present subway work, had already announced that, as a part of the scheme for rapid transit throughout Greater New York, a tunnel would be built to Brooklyn from the south end of New York to connect in Brooklyn with a branch of the Long Island. These two tunnels, taken in conjunction with the additional New York-Brooklyn bridges planned or under construction by the city authorities, would, it was believed, be of immense value in relieving the congestion of population in New York, and in developing the real estate of Brooklyn and Long Island both for industrial and settlement purposes.

In discussing the plan for bringing the New York Central in direct communication with the Pennsylvania, there was some discussion of erecting a railroad bridge over the North River; this bridge to be used by all railroads having terminals in Hoboken and Jersey City, and a central terminal depot to be built in New York City, to which the Central should have access. Owing to the great engineering and financial difficulties of the plan, no decision in regard to it was announced during the year.

New York Municipal Campaign.—The campaign in New York City which resulted, in the election on November 5, 1901, in the defeat of Tammany Hall and the installation of a Fusionist administration, excited wide comment throughout the entire country. Perhaps no election in any section of the United States of recent years gave rise to so many and to so sensational press dispatches, or was asserted to be of so momentous significance. The reasons for this may be summarized as follows: First, since 1897, when Tammany gained control of Greater New York, practically no effort had been made by it to conciliate public opinion or to disprove the charges, naturally brought against a party in power, that it was working for its own profit and not in the interest of the people; second, since 1900, when Mr. Richard Croker, holding the balance of power at the National Democratic Convention in Kansas City, had cast his ballot in favor of Mr. Bryan and the free-silver wing of the party, a large section of the press had come to regard him as a figure of national importance with large powers of doing harm. Therefore the press was prepared to treat him without mercy in the campaign of 1901, and opportunity for making such treatment effective and popular Mr. Croker had himself given by his prolonged residence in England; third, the fact that the revised charter of New York (see paragraph Charter Revision) would go into effect at the beginning of the new administration, and under it the governing power would be greatly centralized and the heads of all departments given much more extensive power; fourth, the alleged corrupt condition of the New York police department.

Shaping of the Campaign.—In 1897 the Republican party had declined to unite with the Citizens' Union, who were foremost in opposing Tammany Hall; and for this reason the Tammany Democratic organization, whose normal majority in New York City is hardly less than 100,000, won easily, notwithstanding the fact that practically the entire press of the city advocated the election as mayor of Mr. Seth Low, the Citizens' Union candidate. This Tammany victory and the resultant state of public opinion brought both the Citizens' Union party and the Republicans to a realization of the expediency and desirability of uniting their votes to defeat Tammany. Both, therefore, were willing to make concessions in 1901 and a ticket was made up on which not only the Citizens' Union and Republican parties were represented, but also all other political fragments opposed to Tammany Hall, of which may be mentioned the German Democrats, the Sheehan Democrats, a seceding segment of Tammany Hall, and the Coffey Democrats, representing largely the labor organizations. After a long series of conferences not altogether harmonious these various anti-Tammany bodies nominated for mayor on September 27 Mr. Seth Low, president of Columbia University and twice mayor of Brooklyn. Tammany

NEW YORK MUNICIPAL CAMPAIGN.—Mayor Seth Low. Edward M. Shepard.

in the meantime, on October 3, nominated for mayor Mr. Edward M. Shepard, an independent Democrat, and in 1897 a pronounced supporter of Mr. Seth Low and the Citizens' Union. In accepting the Tammany nomination Mr. Shepard, whose integrity and ability were well recognized, stated that he would in no wise be bound to his Tammany associates in the conduct of his office; but would conduct it as he personally saw fit in the interests of the people and tax-payers of the city. The press then urged Mr. Shepard to state plainly whether he would if elected remove Mr. Devery from office as deputy police commissioner. This, however, Mr. Shepard refused to do, claiming that any pre-election pledges to gain votes were in violation of the constitution of the State. This logic appeared to the press too fine-spun for the usages of practical life, and, whereas the support of some powerful papers might have been won by a pledge on Mr. Shepard's part to remove Mr. Devery, the result of his refusal was that the entire press turned against him and pointed out that, no matter how great Mr. Shepard's virtue and ability, he would be unable under the revised charter of Greater New York to effect any considerable administrative reform on account of the other nominees on the ticket, who were Tammany men throughout. For, as mayor, Mr. Shepard might indeed remove the heads of nearly all city departments; but the elective officials he could not affect. But under the new charter the governing power of New York is virtually centralized in eight of these elective officials, of whom the mayor is one, and who constitute together the Board of Estimate and Apportionment (see paragraph Charter Revision). In this board, controlling a budget of over \$100,000,000 a year, the mayor has three votes out of a total of sixteen, while over the acts of the other seven officials, either in their individual or collective capacity, he has no jurisdiction. But from what might be termed the criminal, as distinguished from the civil, side of the city administration, Mr. Shepard's position was stated by the press to be even more untenable than from the civil side. For to that class, larger in New York than elsewhere in the western world, who live by their wits or the vices of their fellows, the district-attorney represents the law and the whole law, and his complaisance or severity gauges the measure of their prosperity. But over the acts of the Tammany nominee for district-attorney, Mr. Shepard would have no control, and without that official's assistance and initiative, police corruption and other and worse evils, bitterly complained of by the press, could not be cured. The press having by arguments similar to those outlined above, denied Mr. Shepard's individual power for good, concentrated attention upon the three most prominent of Tammany's representatives. The first of these was Mr. Robert A. Van Wyck, the mayor, who had been nominated by Tammany as a justice of the Supreme Court. Whatever the executive merits of Mr. Van Wyck—and partisanship ran so high that it was difficult to judge them correctly—it was at least generally conceded that he had not given evidence of an unbiased frame of mind while in office or of administrative efficiency, and that he was not fitted for a judicial office. The second point of attack of the Fusion press was against Mr. William S. Devery, who was virtually acting as chief of police and whose appointment by Tammany had balked the act of the legislature (see paragraph New York City Police Department) in abolishing the office of chief of police. As stated by Mr. Edward M. Shepard in the *Atlantic Monthly*, "With a singular fatuity, under skillful goading by the press, he indulged, until the eve of the election, in crude utterances which strengthened the impression of his abuses and operations. His very energy—that most useful single quality, after honesty, in the head of a police force—seemed to possess a baleful fury, exquisitely disturbing to every person intelligently concerned for Democratic success." The third and perhaps most effective attack made by the press was upon Mr. Richard Croker, the leader of Tammany Hall since 1886. "In cartoons and in the virile and unweariedly continuous work of reporters and editorial writers alike, they held him up as a heavy, brutal, dull, insolent, corrupt, tyrannical, reckless, unreasoning, absentee political boss." The attack was effective. Besides these three persons chiefly attacked, exposures of Tammany mal-administration followed each other rapidly throughout the summer; and yet with all the exposures no fiscal corruption of magnitude was proven in any of the city departments, while exorbitant salaries, useless offices, and contracts awarded by favoritism were the worst harms alleged.

A curious feature of the campaign was that the sympathy of the press was so enlisted in favor of the Fusionists that except by means of paid advertisements Tammany could hardly obtain space, much less fair treatment for such arguments as it had to offer. That there were ample grounds for the criticism of Tammany is evident; that the attitude of the press, taken as a whole, was partisan to the verge of hysteria, is perhaps not unjustly inferred from the reflected glow in England of New York opinion, as appearing, for example, in the most conservative of journals, the *London Times*. "It is no exaggeration," said this paper on October 25, "to say that New York is now as unsafe as was a western mining town a generation ago." "Shopkeepers, especially on the East Side, are in a state bordering on panic, while citizens out at night walk on secluded streets literally at the risk of their lives." And

again in an editorial on November 7 the *Times* referred to Tammany as beyond dispute "the most corrupt, brutal, and demoralizing organization that can be found in the civilized world, with perhaps the exception of the Mafia and the Camorra." With statements no less strong than these constantly expressed in New York, it was to be expected that the arguments of Tammany, even when valid, would be swamped in denunciation. Yet two of these arguments were not entirely negligible.

The first was that many of the evils complained of in the city's administration were directly attributable to the Republican State legislature at Albany; that the legislature dictated the salaries of municipal employees, spent by proxy 83 per cent. of the city's hundred-million-dollar annual budget, planked down laws on the city like "so many pounds of beef," and ever by discriminative election and other laws bore in mind that one part of the city was Democratic and the other Republican. Experts in municipal government had for many years besought the legislature to let New York govern itself; but if now a Fusionist administration closely allied with, if not dominated by, the Republican party was to be put into power, matters in this direction would be worse than before. The other Tammany argument was that experience had shown that the Democratic organization, whatever form it took, could not permanently be kept out of power in New York City; nor could any combination of rival parties be devised with enough organic coherence to hang together for more than two or three years at a time. And since the Tammany candidate for mayor was a man of admitted ability and integrity, the desired reformation of Tammany would be accomplished, or at least gotten well under way with his election.

Toward the end of the campaign these arguments of Tammany posted up everywhere as advertising placards appeared, as was stated on good authority, to be winning place against the entire press of the city. But at this juncture the most spectacular feature of the campaign took place; this was a series of speeches delivered by Justice William Travers Jerome, the nominee on the Fusion ticket for district-attorney. Without mincing words and with a fearlessness which once or twice came near alienating some of the elements of his own party, he gave what purported to be a series of illuminated illustrations of the truth of Bishop Potter's accusations against the New York City police department. Both among the better class of people and in the crowded East Side tenement districts he sounded this single note, which became the focus of the campaign and probably contributed more largely than any other single factor to turn the balances of the election against Tammany. The election resulted in giving to the Fusionists every important office in the city of Greater New York. See preceding paragraphs Charter Revision and New York City Police Department; also the article MUNICIPAL GOVERNMENT.

Municipal Elections.—The total vote for Mr. Seth Low, as mayor of Greater New York, was 296,050, and for Mr. Edward M. Shepard, 265,940, thus giving Mr. Low a plurality of 30,110. All other offices of importance on the general municipal ticket also went to the Fusion party; these included: Comptroller, Edward M. Grout; president of the board of aldermen, Charles V. Fornes; district-attorney, William T. Jerome; four justices of the Supreme Court; the president of the Borough of Manhattan, Jacob A. Cantor; the president of the Borough of Brooklyn, J. E. Swanstrom, and president of the Borough of Richmond, G. Cromwell. The elected president of the Borough of Queens was J. Cassidy (Dem.), and the president of the Borough of Bronx, Mr. Haffen (Dem.).

State Elections.—At the elections held on November 5, nine judges of the Supreme Court were chosen, four of whom were for New York City. The judges elected were as follows: From New York City, Morgan J. O'Brien, James A. Blanchard, John Proctor Clarke, and Samuel Greenbaum, all of whom were on the Fusionist ticket. Outside of New York there were elected Aaron V. S. Cochrane (Rep.), E. A. Spencer (Rep.), Garrett A. Forbes (Rep.), Charles E. Parker (Rep.), and William H. Adams (Rep.). There were also elected two State Senators to fill vacancies caused by death, as well as all members of the State Assembly. As a result of this election, the State legislature of 1902 will be represented as follows: In the Senate, 35 Republicans and 15 Democrats, and in the Assembly, 106 Republicans, 42 Democrats and 2 Independent Democrats. An amendment to section 18 of article 3 of the constitution was adopted by a vote of 354,881 against 309,245, taking away from the legislature all authority to pass special acts exempting property from taxation. This amendment, however, will not act to tax property at present exempted.

State Officers.—Elected in November, 1900, for two years: Governor, Benj. B. Odell, Jr., Republican, took office January 1, 1901; lieutenant-governor, Timothy L. Woodruff; secretary of state, J. T. McDonough; treasurer, John P. Jaeckel; engineer and surveyor, Edward A. Bond; attorney-general, John C. Davies; comptroller, E. C. Knight; insurance commissioner, term three years, ending February 11, 1903, Francis Hendricks; superintendent of public instruction, Charles R. Skinner; superintendent of banking department, F. D. Kilburn; superintendent of State prisons, C. V. Collins; superintendent of public works, J. N. Partridge.

Congressional Representatives (57th Congress).—In the House—Frederick Storm (Rep.), from Bayside; John J. Fitzgerald (Dem.), from Brooklyn; Henry Briston (Rep.), from Brooklyn; Henry A. Hanbury (Rep.), from Brooklyn; Frank E. Wilson (Dem.), from Brooklyn; George H. Lindsay (Dem.), from Brooklyn; Thomas J. Creamer (Dem.), from New York; Henry M. Goldfogle (Dem.), from New York; William Sulzer (Dem.), from New York; George B. McClellan (Dem.), from New York; Oliver H. P. Belmont (Dem.), from New York; William H. Douglas (Rep.), from New York; Jacob Ruppert, Jr. (Dem.), from New York; Cornelius A. Pugsley (Dem.), from Peekskill; Arthur S. Tompkins (Rep.), from Nyack; John H. Ketcham (Rep.), from Dover Plains; William H. Draper (Rep.), from Lansingburg; George N. Southwick (Rep.), from Albany; John K. Stewart (Rep.), from Amsterdam; Lucius N. Littauer (Rep.), from Gloversville; Louis W. Emerson (Rep.), from Warrensburg; Charles L. Knapp (Rep.), from Lowville; James S. Sherman (Rep.), from Utica; George W. Ray (Rep.), from Norwich; Michael E. Driscoll (Rep.), from Syracuse; Sereno E. Payne (Rep.), from Auburn; Charles W. Gillet (Rep.), from Addison; James W. Wadsworth (Rep.), from Geneseo; James B. Perkins (Rep.), from Rochester; William H. Ryan (Dem.), from Buffalo; De Alva S. Alexander (Rep.), from Buffalo; Edward B. Vreeland (Rep.), from Salamanca; Montague Lessler (Rep.), from New York; Amos J. Cummings (Dem.), from New York. In the Senate—Thomas C. Platt (until 1903), from Owego, and Chauncey M. Depew (until 1905), from New York—both Republicans.

NEW YORK ACADEMY OF SCIENCES, incorporated 1818 as the Lyceum of Natural History of New York. The sessions of the Academy begin in October and end in May. Meetings are held each Monday at 103 West Fifty-fifth Street, New York City. Membership in 1901, 335; president, R. S. Woodward; secretary, R. E. Dodge, Teachers' College, New York.

NEW YORK PUBLIC LIBRARY, ASTOR, LENOX, and TILDEN FOUNDATIONS, consolidated in 1895, consists of two distinct divisions, the reference and the circulating branches. The former has two buildings, the Astor, 40 Lafayette Place, and the Lenox, at 895 Fifth Avenue, both buildings being open from 9 A.M. to 6 P.M. The latter includes 17 branch circulating libraries in various parts of the city. In 1901, Mr. Andrew Carnegie offered \$5,200,000 for the erection of branch libraries in New York on condition that the city furnish sites and agree to provide for their maintenance. The offer was accepted by the city, through an act of the legislature, which provides that the city shall proceed to acquire not more than 42 library sites in the boroughs of Manhattan, Richmond, and the Bronx. In February, 1901, the New York Free Circulating Library was consolidated with the New York Public Library. At the time of consolidation, it held cash and securities aggregating about \$300,000; it owned five buildings valued at \$300,000 and about 160,000 volumes. It circulated about 1,634,000 volumes per annum. An agreement was entered into during the year with the board of education, whereby the latter furnished the necessary accommodations for libraries in eight public schools and attendants, and the library supplied books and periodicals for reference and circulation. During the past year the number of volumes received was 40,580, of which 19,891 were purchases and 20,689 gifts. The number of pamphlets received was 37,570, of which 12,679 were purchases and 24,891 gifts. The total number of volumes on the shelves and available for use at the end of June, 1901, was 538,957, and about 182,370 pamphlets. The number of readers who visited the two reference library buildings during the year was 143,972, the Astor having received 101,689 and the Lenox 42,283. This is an increase of about 27,256 readers over the preceding year. The total number of volumes and periodicals issued to readers last year was 605,487, of which 544,037 were called for at the Astor and 61,450 at the Lenox. The new building at Fifth Avenue and Forty-second Street is in process of construction. Director, John S. Billings.

NEW YORK UNIVERSITY, in New York City, founded in 1831, comprises ten schools. During the year 1900-01, the faculty numbered 186 and the student-body, excluding duplicate names and auditors, 1,824. They were distributed as follows: College, 233; graduates, 212; applied science, 87; pedagogy, 206; commerce, 67; summer session, 113; law, 601, and woman's law class, 64; medical, 279; veterinary, 42. In the spring of 1901, owing to long-continued dissatisfaction with the administration of the department of pedagogy, three of the professors—Samuel Weir, Edward Franklin Buchner, and Charles H. Judd—handed in their resignations. At the opening of the fall term, the places rendered vacant by the resignation of the three professors were filled by J. P. Gordy, Robert MacDougall, and J. E. Lough, who with E. R. Shaw, Frederick Montaser, and L. E. La Petra, of the old faculty, will constitute the new one. In his opening address to the incoming students, Chancellor MacCracken informally announced that there would be no regular dean in the school of pedagogy.

NEW ZEALAND, a British colony in the south Pacific Ocean, 1,200 miles south-east of Australia, consisting of three islands known as North, Middle (or South), and Stewart islands. The capital is Wellington.

Area and Population.—The total area is estimated at 104,471 square miles, and the population, according to the census of March 31, 1901, was 816,000, of whom 773,000 were whites and 43,000 native Maoris. The increase in the white population during the decade was 147,000, and that of the Maoris, whom it was generally supposed were dying out, was 3,500. The populations of the largest cities are: Auckland, 67,226; Dunedin, 52,390; Christchurch, 57,051; and Wellington, 49,334.

The majority of the inhabitants are Protestants, the Church of England predominating. There are about 100,000 Roman Catholics. The colonial school system is well organized and is administered by a department, the head of which is a cabinet minister. Primary education is compulsory. In December, 1900, there were 1,674 free public primary schools, with 130,724 pupils enrolled, and 304 private schools, with an enrollment of 15,555. In addition, 89 village schools for the Maoris were reported. There are 25 endowed or incorporated high and grammar schools, with 2,544 pupils. At the head of the colonial educational system stands the University of New Zealand, which is solely an examining body. With it are affiliated four colleges—Otago University, at Dunedin; Canterbury College, at Christchurch; Auckland University College; and Victoria College, at Wellington, with a combined enrollment (1899) of 776 students. The total expenditure of the colonial government on education in the year 1900 was £522,411. In 1896 there were 304 public libraries, mechanics' institutes, and similar institutions, with 17,638 members and 409,604 volumes.

Government.—The colony is administered by a governor (the Earl of Ranfurly since 1897), assisted by a responsible ministry of eight members. The legislative power is vested in a legislative council and a house of representatives. Members of the council (45) are appointed by the governor for seven years. Members of the house of representatives (74), of whom four are Maoris, are elected for terms of three years by universal adult suffrage. Women, though allowed to vote, are not eligible for election or for appointment to the council. There is a supreme court for the colony consisting of a chief justice and five puisne justices. The colony supports a volunteer army of 9,835 officers and men, and a police force of 590. Four torpedo boats and four steam launches fitted for torpedo work are owned and manned by the colony.

Finance.—The principal sources of revenue are the customs duties, stamp tax, land tax, railways, and the income tax. The expenditure is largely for public works, some of which, such as railways, telegraphs, and the like, assure a remunerative return. Other items of expenditure include education, defense, and interest on the public debt. The total receipts for the fiscal years ending March 31, 1899, 1900, and 1901, were respectively £5,258,228, £5,699,618, and £5,908,697. The expenditures for the same periods were £4,858,511, £5,140,127, and £5,479,704. The estimated revenue and expenditure for the year 1901-02 were £5,896,000 and £5,763,000 respectively. The receipts from state railways in 1900 amounted to £1,621,613 and the expenditure £1,039,412. The postal returns for the first half of 1901, which it had been thought would show a great decrease on account of the new penny postage system that went into effect on January 1, made it practically certain that the deficit, estimated at £80,000, would not be more than £30,000. The gross public debt in August, 1901, was £49,500,000, or more than £64 per capita for the white population.

Industries, Commerce, etc.—Agriculture is the principal industry. The total area under crops in 1900, including 10,853,302 acres, in sown grass, was 12,474,511 acres. The cereal production in 1899, a year of bad crops, was: Wheat, 8,582,000 bushels; oats, 16,326,000 bushels; and barley, 1,585,000 bushels. Wool raising is increasing in importance, the number of sheep in the islands in 1899 being 19,348,506. The imports have increased in value from £8,739,633 in 1900 to £10,646,006 in 1901, and the exports, from £11,938,335 to £13,246,161 in the same period. The principal exports in 1900 were wool (£4,749,196), frozen meat (£2,123,881), gold (£1,439,602), agricultural products, tallow, and kauri gum, and kauri pine timber. Great Britain furnished 50 per cent. of the imports and took 85 per cent. of the exports in 1901. Gold, coal, and copper are mined. The combined shipping entrances and clearances at the ports of the colony in 1900 amounted to 1,679,907 tons.

On March 31, 1901, there were 2,212 miles of government railway, and 88 miles of private lines in operation, and several extensions of the state lines were under construction.

History.—Early in 1901 two new contingents of Colonial troops were sent to South Africa, making the total furnished by New Zealand up to April, 2,827 men. The Duke and Duchess of Cornwall landed at Auckland on June 11, 1901, and made a tour of the islands. At the opening of the parliament, July 2, the premier, the Rt. Hon. R. J. Seddon, announced that the Federation Commission had reported unanimously against federation with Australia, holding that such a union would be

prejudicial to the finances and hinder the development of the colony. The government programme included legislation to prevent the fixing of abnormal prices by trusts on food-stuffs and coal, the establishment of a state coal mine, and of state railway car shops, the improvement of steamship services, and the regulation of the working hours of clerks in banks and commercial offices. Organized parliamentary opposition to the Liberal party's programme was practically abandoned during 1901.

Since 1890 legislation in New Zealand, in the hands of the Liberal party, has been largely what may be termed experimental, showing a strong tendency toward the extension of state ownership and control of public utilities. Among the measures enacted during the decade 1890-1900 the following are prominent: Compulsory state arbitration of labor disputes, an income tax, a graduated inheritance tax, the condemnation, purchase, breaking up, and re-sale of large estates in order to increase the number of small holdings, old-age pensions, the extension of the state telegraph and railway lines, the assumption of state control over the Bank of New Zealand, woman suffrage, and a graduated land tax. Thus far the legislation seems to have been beneficial to the colony, the population having increased in 10 years 22.5 per cent.; savings bank deposits, 117.8 per cent.; improvements, 52 per cent.; private wealth, 52 per cent.; cultivated lands, 55.6 per cent.; number of holdings, 64 per cent.; imports, 45.28 per cent.; and exports, 25.15 per cent. Critics of the Liberal policy, on the other hand, assert that the increase in population is below the average, that the per capita debt is larger than that of any country in the world outside of Australia, and that there is a strong probability that the public works, upon which, up to March 31, 1900, the sum of £32,978,626 had been expended, would not prove "reproductive" as had been expected.

NICARAGUA, the largest republic of Central America, lies south of Honduras and north of Costa Rica. The capital is Managua.

Area and Population.—The total area of the 13 departments, 2 territories, and 3 districts comprising Nicaragua has been estimated at 49,200 square miles, and the population (1895) at 420,000, including 40,000 uncivilized Indians. The inhabitants are mostly Indians, mestizos, mulattoes, and negroes. The populations of the principal towns are estimated as follows: Leon, 35,000; Managua, 25,000; Masaya, 20,000; Granada, 19,000; Chinandega, 12,000; Jinotepe, 6,500; Jinotega, 4,325; Matagalpa, 4,000; Bluefields and Greytown, each over 2,000.

Education is in a very backward condition. In 1901 there were in addition to a number of municipal and private schools 209 public primary schools, 48 grammar schools, and 5 secondary schools. The appropriations for education in the fiscal year 1901 amounted to about 1,000,000 pesos. The pupils in the elementary schools numbered about 18,000.

Government and Finance.—The chief executive is a president elected by popular vote for a term of four years. Señor José Santos Zelaya was elected for the terms ending 1898 and 1902, and again, in November, 1901, for the term ending 1906. The national legislature consists of a congress of one house elected for two years. The active army numbers about 2,000 men.

The monetary standard is silver, and the unit of value the peso, worth 54.1 cents on October 1, 1900, and 42.8 cents on October 1, 1901. Revenue accrues chiefly from customs and excise, and expenditure is largely for the departments of finance, war, and fomento. Revenue and expenditure in 1898 amounted to 4,009,603 pesos and 4,824,138 pesos respectively; for 1900, the estimates were 6,408,000 pesos for revenue and 6,414,951 pesos for expenditure. In July, 1900, the foreign debt stood at \$1,355,831 and the internal debt at about \$2,666,000. The latter debt was augmented in 1901, pursuant to a presidential decree of February 4, by a loan of 1,000,000 pesos (about \$451,000), guaranteed by a lien on a part of the customs. Accordingly the total debt of Nicaragua may be placed at upwards of \$4,470,000. It is stated that in 1901 the paper currency regained its par value.

Industries and Commerce.—The principal industries are cattle-raising and agriculture. The leading crop is coffee, and others of importance are bananas, sugar, and tobacco. There are valuable mineral resources, but the exploitation is not extensive; gold, however, was exported in 1898 to the amount of 12,242 ounces. In the spring of 1901 the British consul reported an improvement in trade, owing largely to the fact that for the first time in five years there had been no revolutionary outbreak. The coffee crop was the largest harvested, being double that of either of the two preceding years. The reported imports and exports in 1899 amounted to 5,236,165 pesos and 6,981,472 pesos respectively; in 1900, 5,516,523 pesos and 6,289,483 pesos respectively. Cotton goods, largely from Great Britain, constitute almost one-half of the imports, and coffee comprises over one-half of the exports. The percentages of imports from and exports to the countries of greatest trade importance were in 1900: The United States, 50.7 and 47; Great Britain, 28.7 and 12; France, 11.6 and .03; Germany, 4.2 and 24.

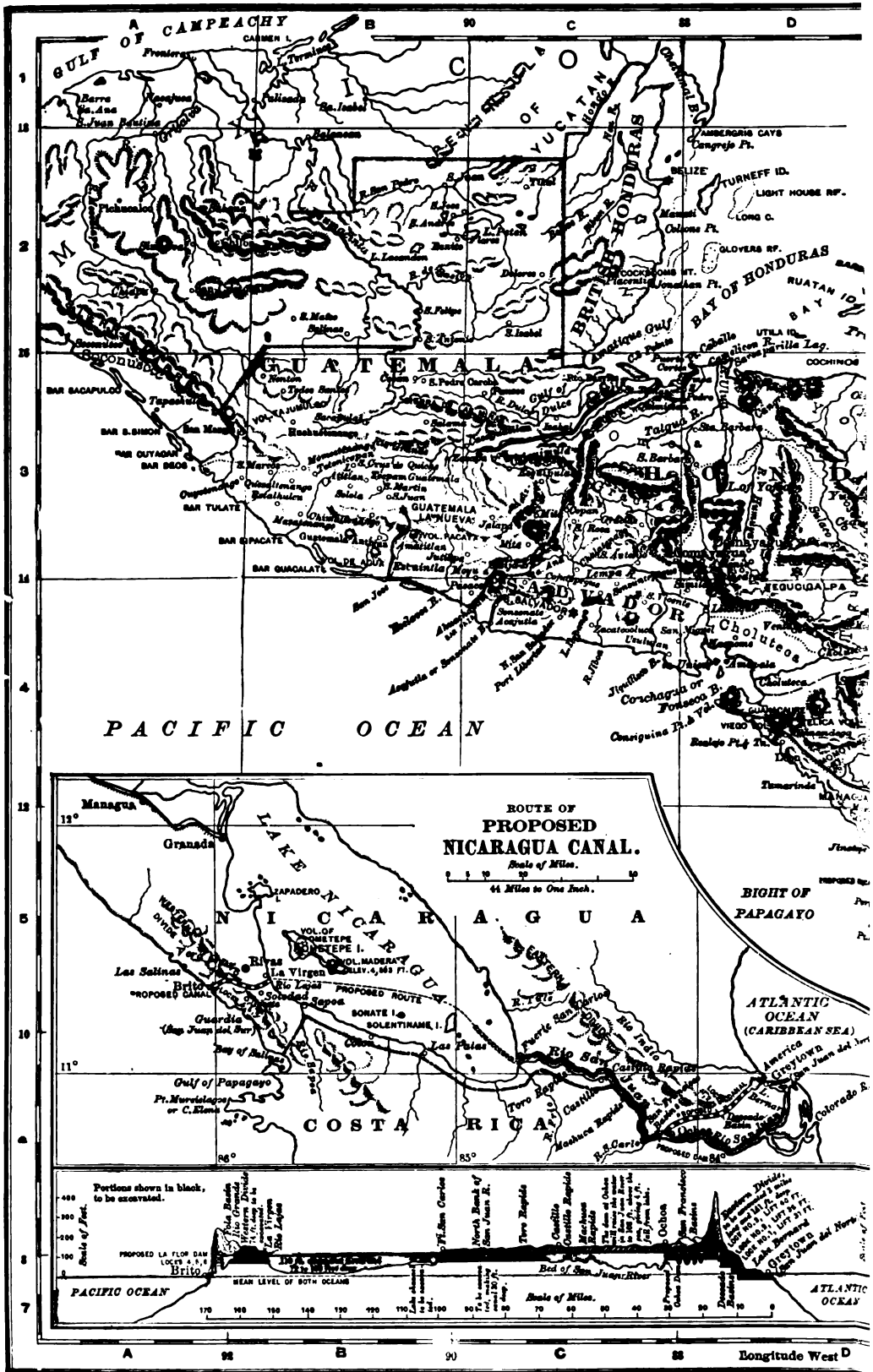
There are about 140 miles of railway. The work on the railway between Managua and La Paz, which will connect the two sections of the Central Railway, progressed

during 1901 and would be completed, it was thought, early in the following year.

Events of 1901.—In October the treaty of friendship, commerce, and navigation of 1867, with the United States, under which the latter country was empowered to construct a canal across Nicaragua, and the extradition treaty of 1870 were denounced by the Nicaraguan government. The expiry of the first treaty takes place on October 24, 1902, and of the second May 24, 1902. No explanations were given for these treaty terminations, but the Nicaraguan minister at Washington assured the United States government that they were in no way prejudicial to the friendly relations of the two republics. On December 9, 1901, a new treaty, by which Nicaragua agreed to lease in perpetuity to the United States a strip of land embracing the proposed Nicaragua canal, and to assign the policing thereof to the United States, was signed by the United States minister to Nicaragua and the Nicaraguan minister for foreign affairs. The reelection of President Zelaya is mentioned in the paragraph on Government. See CENTRAL AMERICA.

NICARAGUA CANAL. *Isthmian Canal Treaty.*—On December 16, 1901, the United States Senate, by a vote of 66 to 6, ratified the Hay-Pauncefote Isthmian Canal Treaty. Previously, on February 5, 1900, a treaty between Great Britain and the United States to "facilitate the construction of a ship canal to connect the Atlantic and Pacific Oceans," and to remove any objections arising out of the Clayton-Bulwer treaty to the construction of such a canal under the auspices of the government of the United States had been submitted by President McKinley to the United States Senate. Important amendments were introduced by the Senate for the purpose of accomplishing these three objects: First, to secure an entire abrogation of the Clayton-Bulwer treaty by which the neutrality of the canal was guaranteed. Second, to give the United States sole control of the canal in time of war or when, for any other reason, it was deemed necessary. Third, to eliminate for all time European political interest in the canal. By its own terms this treaty was to become operative only if ratified by Great Britain prior to March 5, 1901. But Great Britain did not ratify it; it therefore expired by limitation. The reasons for Great Britain's refusal to ratify the original treaty as amended by the Senate were set forth in a memorandum from Lord Lansdowne, secretary of state for foreign affairs, dated February 22, 1901. To the original treaty as drawn up by Lord Pauncefote and Secretary Hay, the Senate, as Lord Lansdowne said, had made three amendments. By the first amendment, the United States abrogated the Clayton-Bulwer treaty, and with it the agreement not to "occupy or fortify or colonize or assume or exercise dominion over any part of Central America." "The change," said Lord Lansdowne simply, "would certainly be of advantage to the United States, and might be of substantial importance." By the second amendment, the United States, notwithstanding those sections of the Hay-Pauncefote treaty which attempted by exact specifications to safeguard the neutrality of the canal, reserved to itself the right to take such measures as it deemed it necessary to "secure by its own forces the defense of the United States and the maintenance of public order." In explanation of this amendment, the Senate stated that a similar amendment in the Suez Canal convention permitted the sultan, notwithstanding the neutrality of the canal, to take necessary measures for the defense of Egypt. Yet not only, said Lord Lansdowne, is the privilege given to the sultan limited by his agreement not to build fortifications near the canal, but on closer examination the whole analogy breaks down, for the reason that the Suez traverses the domain of the sultan, whose established interests must be protected, while the proposed Nicaraguan Canal is not expected at any point to enter the boundaries of the United States. More formidable objections remained, for by the third amendment the United States withdrew the invitation to the other powers to subscribe to the terms of the treaty, and therefore gave them liberty to disregard at will "any of the restrictions imposed by the convention." While then by the second amendment the United States claimed the right to disregard the neutrality of the canal, and while by the third amendment the same right was given to the other powers to disregard it, "Great Britain alone, in spite of her enormous possessions on the American continent, in spite of the extent of her Australian colonies and her interests in the East, would be absolutely precluded from taking measures to secure her interests in and near the canal." For these reasons, Great Britain felt unable to accept the amended convention and preferred to stand on her rights as given by the Clayton-Bulwer convention, "an international contract of unquestionable validity." But Lord Lansdowne intimated, nevertheless, that overtures for further negotiations would be received in a friendly spirit.

The Final Treaty.—In accordance with Lord Lansdowne's hint, negotiations for a new treaty which should at once satisfy Great Britain and the United States Senate were immediately started. Those senators whose opinion was likely to have peculiar weight, and especially Senator Henry C. Lodge, chairman of the Senate committee on foreign relations, were brought into consultation, and a new treaty was signed on November 18, 1901, transmitted to the Senate on December 5, and ratified by that



[illegible]

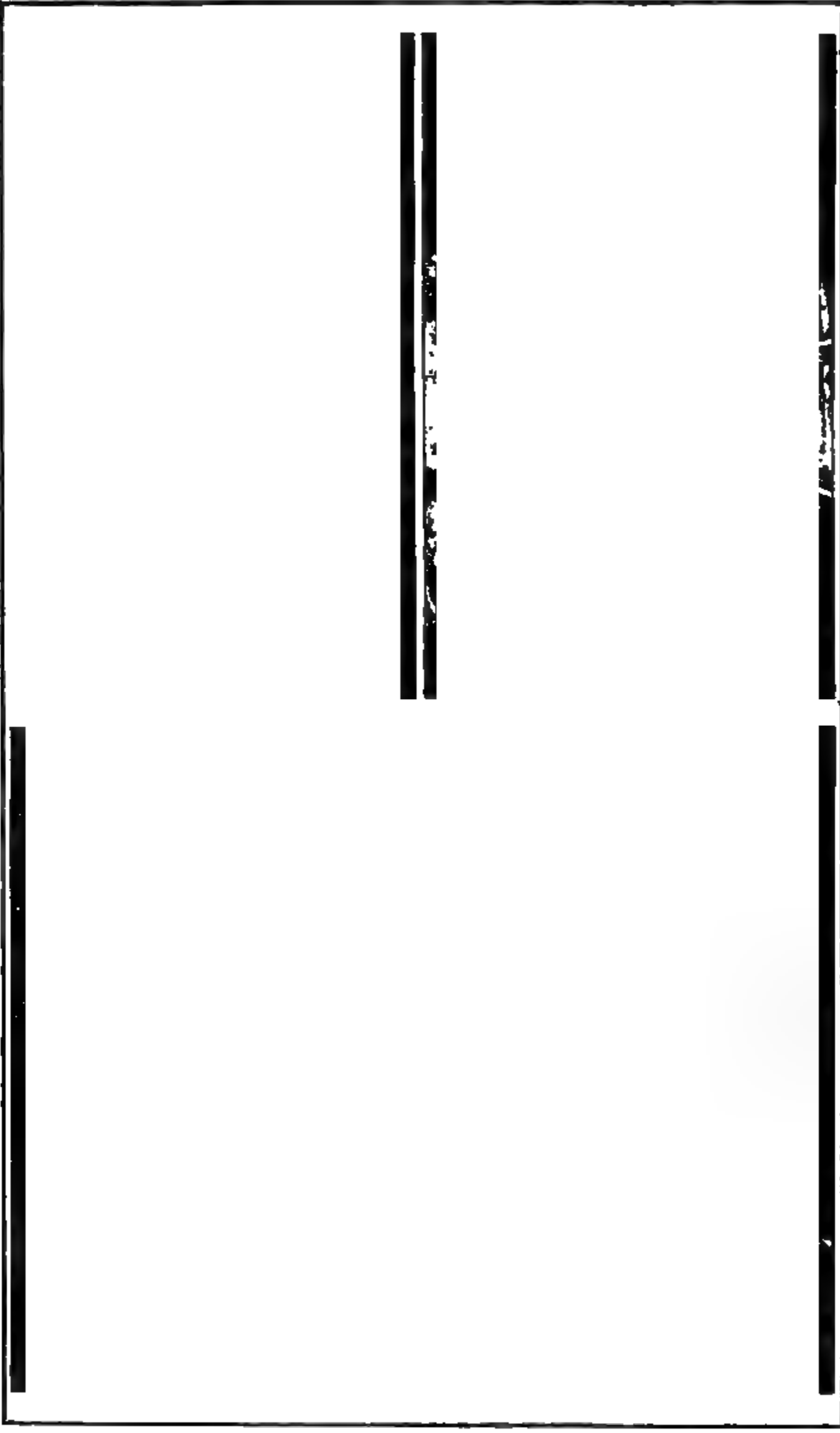
COPYRIGHT, 1902, BY DODD, MEAD & COMPANY.

body eleven days later with practically no opposition. The main differences between this treaty and the prior one are three: (1) While the "general principle of neutralization" of the Clayton-Bulwer treaty is retained, that treaty itself is abrogated; (2) neither Great Britain nor any other power guarantees or is to be asked to guarantee the neutrality of the canal; (3) the United States gains certain rights as to the control and disposition of the canal in time of war, but how much control is not specifically stated, and is open to diverse interpretation. From Great Britain's point of view, there can be no doubt but that the main right for which she contended and which was accorded her under the new treaty is the right to be relieved from any obligation in respect to the neutrality of the canal, if the other foreign powers are also relieved of this obligation. That is to say, if the United States, in case of war either with England or with any European state, claims that the canal is not to be considered neutral, then Great Britain under the final treaty is as free as the United States to take whatever action she deems proper in the premises. With regard to the abrogation of the Clayton-Bulwer treaty, it is to be observed that the general principle of neutralization of that treaty is said to be retained. At the same time, it must be said that in Article 3 of the new treaty it is stated that the United States adopts as the basis of this neutralization substantially the same rules as are embodied in the Suez Canal convention on October 28, 1888. But in these Suez Canal rules it is provided, among other things, that the sultan may, notwithstanding the neutralization of the canal, take necessary action for securing by his own forces the defense of Egypt. Now, while no qualifying clause similar to this is to be found in the Isthmian treaty, it nevertheless remains true that the basis of the neutralization of the Isthmian Canal is declared to be identical with that of the neutralization of the Suez Canal. It is also significant in this connection that the amended treaty does not specifically state that "the canal shall be free and open in time of war as in time of peace," nor does it state that "no fortification shall be erected commanding the canal or the waters adjacent." It does, however, reiterate the clause of the original treaty that "the canal shall never be blockaded, nor shall any right of war be exercised nor any act of hostility be committed within it." But perhaps because the explicitness of the clauses guaranteeing the neutrality of the canal was relaxed, and perhaps because it is stated that the general principle of neutrality shall be, not as in the original treaty "as embodied in the convention between Great Britain and certain other powers signed in Constantinople October 29, 1888," but as "signed the 28th of October, 1888, for the free navigation of the Suez Canal" (that is to say, allowing the hypothesis that the obligations of the United States in the new treaty are now analogous, not to those of Great Britain in the Suez convention, but to those of the sultan in the Suez convention), that one so eminently qualified as Senator Lodge to interpret the treaty, announced in effect that the general principle of neutralization still retained from the otherwise abrogated Clayton-Bulwer treaty was in fact annihilated by subsequent clauses of the convention, and that the United States could do precisely as it chose in case of war in the matter of exercising military jurisdiction over the canal and its approaches, and of erecting fortifications there. Moreover, a certain added plausibility is given to Senator Lodge's view from the fact that the Isthmian Canal Commission in its final report of December, 1901, in recommending that the Nicaraguan route be chosen, recommended also that a strip of land ten miles broad be acquired by the United States along the entire route of the canal; but this strip if acquired would clearly give the United States all the rights in the premises which the sultan possesses under the Suez convention. Other senators took the same or similar views to that expressed by Senator Lodge, and in fact it may probably be stated without exaggeration that if these views had not been held generally in the Senate, the treaty would not have been ratified. On the other hand, the views expressed in the Senate were denied by a part of the press which maintained that only a crooked construction of the treaty provisions could support the senatorial view. In any event, it was pointed out that eminent naval authorities had held that fortifications adjacent to the canal, and in general the defense of the canal by land fortifications in time of war would be of small utility. The canal would in fact be controlled by the naval fleet dominating the Caribbean Sea; and enforced or observed neutralization within three miles of the canal would have practically no weight one way or the other. It was in brief the ships that could get to the canal that could rely upon getting through it. One further clause of the treaty as signed is deserving of consideration. That is the one which prescribes that no change in the territorial sovereignty of the countries traversed by the canal shall affect the general principle of the canal's neutralization. This clause is obviously a substitute for that section of the original Clayton-Bulwer treaty, which bound both Great Britain and the United States not to gain sovereignty or dominion in Central America. Great Britain, it would appear, is still limited in gaining such sovereignty by so much of the Monroe Doctrine as the United States should see fit to apply in any particular case coming to its notice. But the United States is now left entirely free in the matter.

Report of the Isthmian Canal Commission.—By an act passed by Congress on March 3, 1899, the President was directed to appoint a commission to determine the most feasible and practicable route for a ship canal across the Isthmus of Panama, and to report to Congress the result of their investigations. In accordance with this act, President McKinley appointed a commission of nine members, consisting of Rear-Admiral John G. Walker, president, representing the Navy; Colonel Peter C. Hains and Lieutenant-Colonel Oswald H. Ernst, representing the Army; ex-Senator Samuel Pasco, representing the commission legally; Emory R. Johnson, representing the commercial interests of the canal; and George S. Morrison, William H. Burr, Alfred Noble, and Lewis M. Haupt, civil engineers. A preliminary report was made by the commission in December, 1900, and its final report was sent to Congress on December 4, 1901.

The commission stated in its final report that all possible routes had been examined for a ship canal across the isthmus, and that of these only two, the so-called Nicaragua and Panama routes, had been found practicable. Either of these, the commission stated, could be readily built, but the former was recommended, unless the Panama Company at present holding control of the Panama route could be induced to sell its rights and privileges for what the commission considered a reasonable sum. Specifications for either canal called for a minimum depth of water of 35 feet, a bottom width of 150 feet, and locks of 740 feet in length by 84 feet wide by 35 feet deep. These specifications would allow the passage either of ocean-going steamers of the greatest present size and tonnage, or of warships with a maximum beam. The canal along the Nicaragua route built upon these specifications was estimated by the commission to cost \$189,864,062. Its length would be 183.66 miles and the time required for vessels to pass through it would be 33 hours. The cost of a canal on the Panama route built upon the same specifications, and exclusive of the valuable work already done by the French Panama Company and its predecessors, would cost \$144,233,358, its length would be 49.09 miles, and the time of transit would be 12 hours. The Panama route, although only about one-fourth the length of that of Nicaragua, and having fewer locks, less elevation of summit level, and less curvature, all of which factors would decrease the risks attendant upon vessels passing through the canal, was nevertheless stated to be less favorably situated than the Nicaragua route for vessels sailing from New York or England to the far East or to the Pacific coasts. On the other hand, the small number of vessels sailing between New York or Europe and the west coast of South America would find the Panama route shorter. The comparative distances of the two routes are given as follows: between New York and San Francisco, the Nicaragua route is 377 miles shorter than the Panama; between Liverpool and San Francisco, 386 miles shorter; between New Orleans and San Francisco, 579 shorter; between New York and Yokohama via Honolulu, 255 miles shorter; between Liverpool and Honolulu, 264 miles shorter; between New Orleans and Honolulu, 457 miles shorter; between New York and Shanghai via Honolulu, 255 miles shorter; and between Liverpool and Shanghai, 264 miles shorter. On the other hand, between New York and Guayaquil, the Panama route is 383 miles shorter; between Liverpool and Guayaquil, 374 miles shorter; and between New Orleans and Guayaquil, 181 miles shorter.

If the Nicaragua route were chosen, the commission advises that a strip of land some ten miles wide be acquired throughout the length of the canal. No concessions have been granted to any other country by either Nicaragua or Costa Rica, which countries the Nicaragua canal would traverse, and both these countries have professed willingness to grant concessions to the United States. On the other hand, the government of Colombia has already granted concessions to the Panama Canal Company which are absolutely valid until 1904, and probably until 1910. By this concession, moreover, it is prescribed that the Panama Company shall never alienate its concession to any other nation, and therefore the United States could not take over the construction and operation of the Panama Canal unless simultaneous agreements were made both with the Colombian government and with the Panama Company. The Colombian government, however, has intimated its willingness to make arrangements with the United States and overtures have been made by the commission to the Panama Company, and the Panama Company has agreed to sell out to the United States government for \$109,000,000. But the commission does not believe that the work done by this company on the Panama Canal is worth more than \$40,000,000 at the outside, and, therefore, unless the Panama Company greatly reduces the price asked, the commission recommends that the Nicaragua route be adopted. The time in which the Nicaragua Canal could be completed is estimated at eight years, and for the Panama Canal, ten years. At each end of the Panama route, harbors already exist, though considerable work would have to be done at the entrance of the harbor on the Atlantic side. There are no harbors at either end of the Nicaragua route, Brito on the Pacific side being nothing more than a beach, while at Greytown on the Caribbean, the shifting sands caused by the ocean currents would make the construction of a suitable harbor very expensive and its maintenance



SCENES ON NICARAGUA CANAL ROUTE.- View on a Costa Rican River. Ometepe,
Volcano in Lake Nicaragua. San Carlos on Lake Nicaragua. Salico
Lake Railroad.

difficult. Another disadvantage of the Nicaragua route is that the rainfall is exceedingly heavy, varying from 300 to 100 inches annually between Greytown and Lake Nicaragua.

The engineering plans for the Nicaragua route include a large masonry dam on the San Juan River about 53 miles from Lake Nicaragua to store and regulate the fall of water from Lake Nicaragua so that a bountiful supply of water might at all times be afforded for the canal and for its locks, of which four on each side of the lake would be required to pass ships up to the lake level from either ocean. These locks would have lifts varying from $18\frac{1}{2}$ to 37 feet, and would be distributed at points along the line where foundation rock has been found. From Lake Nicaragua to the Caribbean, the route to be followed approximates to that of the San Juan River. Between the lake and the continental divide toward the Pacific, the canal line follows the course of the small Lajas River, and from the divide to the Pacific it follows the course of another small river, the Rio Grande. The construction for the Panama Canal includes as its main feature the construction of an artificial lake—Lake Bohio—at the summit of the divide between the Atlantic and Pacific. This lake would be supplied by the Chagres River and would be 85 feet above mean sea level. The final line of the canal would be from the entrance to Colon Harbor on the Caribbean to the Bohio locks and dam, 16.81 miles; thence vessels would traverse the lake to the two locks on the Pacific side, at Pedro Miguel, a total distance of 21.87 miles. From Pedro Miguel, the entrance to Panama Harbor on the Pacific, the distance is 10.41 miles, making the total distance traversed 49.09 miles.

NICKEL. The only nickel and cobalt produced in the United States in 1900 were obtained as by-products from the smelting of lead ores at Mine Lamotte, Mo. The matte containing these two metals are refined at New York and at Camden, N. J. From 75,220 pounds of matte there were extracted 9,715 pounds of metallic nickel and 6,471 pounds of cobalt. This is a decrease of 12,826 pounds of nickel and 3,759 pounds of cobalt from the 1899 production. Attempts were made in 1900 to develop properties in Oregon and Idaho, and even to start up the old Gap Mine in Lancaster County, Pa. The imports of nickel in 1900 had a total value of \$1,183,884, while those of cobalt oxide were valued at \$88,651. Most of the nickel matte which is produced at Sudbury, Ont., from ores mined in that locality, is sent to the United States for refining. The exports of nickel oxide from this country in 1900 amounted to 5,869,900 pounds, valued at \$1,382,727. There was an active demand for nickel in 1901, the price being from \$50 to \$60 a ton. Active prospecting in the past few years has resulted in the finding of a deposit of nickel and cobalt ore near Bunker-ville, in southeastern Nevada. The deposit is said to be very similar to that at Sudbury. The new alloy of iron and nickel similar to Josephinite has been found near Gasquette, Del Norte County, Cal.

NICOLAY, JOHN GEORGE, historian, and former private secretary to Abraham Lincoln, died in Washington, D. C., September 26, 1901. He was born at Essingen, Bavaria, February 26, 1832, and came to the United States in 1838, where he was educated in the Cincinnati (O.) public schools. From the position of editor and proprietor of the Pike County (Ill.) *Free Press*, he went in 1857 to Springfield as an assistant to the secretary of state, and when Abraham Lincoln was nominated for the Presidency in 1860, became his secretary, retaining the position until Lincoln was assassinated. In 1874 Nicolay, in collaboration with John Hay, who was also a private secretary to Lincoln, began the biography of the dead President which, under the title, *Abraham Lincoln: A History*, finally appeared in 1890. Nicolay also wrote, in 1881, *The Outbreak of the Rebellion*, besides contributing the article on Abraham Lincoln to the *Encyclopædia Britannica*, and various articles to American magazines.

NIGERIA, comprising the two British protectorates, Northern Nigeria and Southern Nigeria, extends from the eastern part of the Gulf of Guinea northward to the French Soudan. The area and population are unknown, estimates of the former ranging from 350,000 square miles to 500,000 square miles, and of the latter from 25,000,000 to 40,000,000. Of particular interest is the Hausa race, who have attained considerable development in civilization and industry. Revenue and expenditure for the fiscal year 1900 amounted to £164,108 (of which £156,491 from customs) and £176,140 respectively; in the following year the revenue amounted to £380,894. The total imports and exports for the fiscal year 1900 were valued at £725,798 and £888,954 respectively; for 1901, imports £1,199,680, and exports £1,166,147. In the latter year the imports from and the exports to Great Britain were valued at £987,092 and £181,365 respectively. Trade with Germany is increasing. The leading products and exports are palm kernels, palm oil, rubber, ivory, ebony, hides, gums, and cacao; the chief imports are cotton goods, spirits, salt, and tobacco. The importation of spirituous liquors to Northern Nigeria is prohibited.

Northern Nigeria.—This protectorate, formerly called the Niger Territories, is administered by a high commissioner, Brigadier-General Sir F. J. D. Lugard. The commandant of the troops, who number about 2,500, is Colonel Sir James Willcocks.

As soon as the West African Frontier Force returned to the Niger from their campaign of 1900 in Ashanti, they were dispatched in two expeditions against the emirs of Kontagora and Bida, who for some months had terrorized and almost depopulated a large extent of territory, killing or enslaving 8,000 natives, and who, it was feared, would combine forces against the British. These emirs were the most powerful, excepting the emir of Sokoto, in Northern Nigeria. On January 10, 1901, General Lugard sent out northward from Jebba, a town on the Niger, two companies under Colonel Kembell, which were joined near Momba by two other companies, the total number being about 400. These were native troops officered by Englishmen. Not far from Kontagora the enemy were easily dispersed, but when the British force came within sight of that town, it was confronted by 5,000 men, including cavalry, who made a stubborn resistance. They were armed with bows (and poisoned arrows), rifles, and trade guns. They finally gave way after sustaining heavy losses, and the British entered Kontagora, which was found to be an extensive walled city that had had some 25,000 inhabitants. It was deserted, however, and the emir had escaped, and, though his forces were crushed, he was not subsequently captured. Colonel Kembell proceeded to Kaduna, where he met the high commissioner commanding a battalion. The united forces were concentrated at Wuyu, near Bida, and the forces of the emir of the latter place were overpowered. The emir, however, like the emir of Kontagora, escaped. On February 17 the high commissioner installed the makum; that is, the heir-apparent, as emir of Bida. It should be remembered that the makum had been installed by the British in 1895, but had been ousted by the former emir. Captain Cochrane was made military resident and given a strong garrison. The expedition brought about the release of thousands of slaves, and its general effect on the country was doubtless far-reaching and salutary. It was thought that the emirs of Kontagora and Bida would not be able again to assemble a force of any considerable magnitude.

A punitive expedition commanded by Lieutenant-Colonel Morland against the Emir Zuberu of Yola reached that town on September 2. Zuberu, who was one of the most powerful of the Fulani rulers of the Sokoto empire and who had governed the large province of Adamawa, had raided large tracts of country for slaves, disregarding repeated warnings from the Nigerian administration. Consequently an expedition, consisting of upwards of 380 men, with two 75-millimetre guns and four Maxims, advanced on Yola, which has some 30,000 inhabitants and is situated on the river Benué not far from the Cameroon border. The town was taken after a sharp engagement in which the emir's forces suffered about 150 casualties and the British 41. The emir escaped, and on September 8 his brother, Bobo Amadu, was installed as emir of British Adamawa, to the general satisfaction of the inhabitants. Although the administration did not intend to interfere immediately with domestic slavery in the province, slave-raiding, it was thought, had ceased.

Southern Nigeria.—The protectorate borders the Gulf of Guinea between Lagos and Cameroon. It is administered by a high commissioner, Sir R. D. R. Moor. The seat of government is the port Old Calabar. The military force consists of about 1,100 men. The construction of new roads is progressing. Prospects for the development of the timber and rubber industries are good; a forestry department has been organized for the preservation of the rubber forests in Benin.

In November, 1899, a small British party was attacked in the northeastern part of the Benin region, which had never been brought under authority of the government, and though the offenders were punished, the establishment of actual control could not be attempted, on account of the service of the troops in Ashanti during 1900 and unsettled conditions in other parts of the protectorate, until the spring of 1901. On March 1, of the latter year, an expedition numbering about 250 under Major Heneker, sailed from Old Calabar for Gilli Gilli en route to Benin City. From that point the border of the district aimed at—known as Ishan territory, a large tract of country and thickly populated—is about 70 miles distant. Opposition was first encountered by the British force on March 15 at Akisibaw, about 65 miles from Benin City, and severe fighting ensued. On the 20th, Uromi was taken, and soon after Etia, the chief town. The native chiefs then considered terms of submission.

Toward the end of 1900 an expedition of 1,500 troops, in four columns, was dispatched against the Aro tribes who occupy the country between the Cross and Niger rivers. For some time these tribes had been engaged in slave dealing. It was expected that the military operations would be somewhat protracted in character, lasting perhaps until the following April. In December, however, the expedition, though meeting considerable resistance, was making rapid progress. Bendi was occupied on the 16th, and on the 28th Arochuku was burned. Considerable fighting was reported, in which the natives suffered many casualties. By the end of the year six important chiefs had surrendered.

NINDE, WILLIAM XAVIER, D.D., LL.D., bishop of the Methodist Episcopal Church, died at Detroit, Mich., January 3, 1901. He was born at Cortland, N. Y., June 21, 1832, and graduated at Wesleyan University in 1855. After teaching school

for a year he was ordained to the ministry and attached to the Black River Conference in New York, remaining there until 1861, when he was transferred to the Cincinnati Conference. In 1870 he was placed in the Detroit Conference and continued to labor there until chosen professor of practical theology at the Garrett Biblical Institute, Evanston, Ill., in 1873. He became president of the school in 1879 and continued as such until 1884, when the General Conference of the Methodist Episcopal Church elected him one of the board of bishops. Bishop Ninde was a delegate to the Methodist Ecumenical Conference at London, 1881.

NOBEL PRIZES, established by the will of Alfred Nobel, were first awarded on December 10, 1901. Nobel was born at Stockholm, Sweden, October 21, 1833, and died December 10, 1896. He was the inventor (1867) of dynamite, and acquired a fortune of nearly \$10,000,000 from the manufacture of explosives. His will provided that his entire fortune be placed in a trust fund, the annual interest, divided into five equal parts, to be given to five men achieving the most distinguished results in as many departments of human activity. The branches of activity named in the will were physics, chemistry, physiology or medicine, literature (idealistic), and efforts toward international peace and the reduction of the burdens of militarism.

The prizes are awarded by the following bodies: For work in physics and chemistry, the Swedish Academy of Sciences; physiology or medicine, the Caroline Institute at Stockholm; literature, the Stockholm Academy; and for efforts toward peace, a committee of five members elected by the Norwegian *Storting*. "It is my express desire," the will read, "that, in awarding the prizes, no account shall be taken of nationality, in order that the prize may fall to the lot of the most deserving, whether he be Scandinavian or not." In the articles of foundation, which were approved in June, 1900, the sum of \$8,400,000 was set aside as a permanent fund, and investments were made in the national securities of England, France, Italy, Russia, Sweden, and Norway, and also in landed estates in France, Italy, and Sweden. With an average interest rate and income of 3 per cent., about \$250,000 a year are available for distribution. The provision that the prizes be given for work done "during the year just passed," was interpreted to mean the most recent results in the several branches, though all work done previously by the candidates is to be considered. Further, each awarding corporation may decide whether the prize go to a society or institution. Nominations are made to the awarding corporations by recognized learned societies in the various countries, and the announcement of the winners and the awards of the prizes are to be made on December 10 of each year. Each of the winners must, if not prevented by illness or other unavoidable delay, within six months, hold a public meeting on the subject of his special work, the meetings to be called at Stockholm, or (in the case of the prize for the promotion of peace) at Christiania, Norway.

After allowing for the expenses of administration, and library and institute aid to the awarding corporations, the amount available for each prize in 1901 was \$40,424. The winners were: In physics, Wilhelm Conrad Röntgen (*q.v.*); in chemistry, Jacobus Henricus van't Hoff (*q.v.*); in medicine, Emil von Behring (*q.v.*); in idealistic literature, Armand Sully-Prudhomme (*q.v.*); and in the work for the promotion of peace, one-half to Frédéric Passy (*q.v.*), and one-half to Henry Dunant (*q.v.*). These selections were thoroughly in harmony with Nobel's desire to reward those workers in pure science whose incomes are usually insignificant; for financially, few discoveries in these branches can be patented and applied to commercial uses. In the same way, the highest form of literary endeavor cannot become popular and win adequate reward. In connection with the award of one-half of the peace prize to M. Dunant, who at the time was reported to be ill and destitute in a Swiss hospital, it is interesting to record Nobel's statement that, while giving money to a man of affairs only results in intellectual stagnation, "I would willingly help a dreamer who may have got into difficulties." It is significant, too, that Nobel, who by his discoveries contributed most to the destructiveness of war, should have recognized in his benefactions the most conspicuous efforts for the prevention of war. The winning of a Nobel prize will ordinarily relieve the recipient of the care of earning a livelihood, and will thus enable him to pursue his special subject unimpeded.

NORDENSKJÖLD, Baron ADOLF ERIK, Swedish scientist and explorer, died at Stockholm, August 12, 1901. He was born at Helsingfors, Finland, November 18, 1832, and was educated in the sciences at the University of Helsingfors, and early in life entered the service of the government in the mining department. Falling under the suspicion of the Russian government, however, he was compelled to leave Finland, and settled in Sweden. He was appointed superintendent of the mineralogical museum of Stockholm in 1858; accompanied Torell on Arctic expeditions in 1859 and 1861; and led expeditions himself in 1864, 1868, and 1872, going once, in 1870, to Greenland. The results of his observations were published in geographical and mineralogical pamphlets, among which was his *Redogörelse för en Expedition till Grönland* (1871). In 1878 he succeeded in doubling Cape Tchelyuskin, being the first to make the northeast passage. For this he was created baron and appointed a

commander of the Nordstjerne order. In 1883 he penetrated the ice barrier on the east coast of Greenland, a feat which had been attempted by explorers for three centuries.

NORDHOFF, CHARLES, American journalist and author, died at San Francisco, Cal., July 14, 1901. He was born in Westphalia, Prussia, in 1830, and came to the United States in 1835, receiving a common-school education in Cincinnati, O. Apprenticed to a printer in 1843, he worked for a year in Philadelphia, and then entered the navy, where he served three years. From 1857 to 1861 he was employed in the publishing house of Harper and Brothers, of New York City, and from the latter year till 1871 was connected editorially with the New York *Evening Post*. After traveling for a time in California and the Hawaiian Islands, Mr. Nordhoff became, in 1874, Washington correspondent for the New York *Herald*. Among his publications are: *America for Free Workingmen* (1865); *Cape Cod and All Along Shore* (1868); *Northern California, Oregon, and the Sandwich Islands* (1874); *Politics for Young Americans* (1875); *God and the Future Life* (1881); and *Peninsular California* (1888). Mr. Nordhoff was a man of great individual force, a keen observer, and a fearless critic.

NORMAL SCHOOLS. During the year 1899-1900 the public normal schools in the United States increased from 166 to 172, and the number of students from 44,808 to 47,421. The number of instructors in the same year was 2,171, including 1,236 females. Of the 9,072 teachers graduating from public schools in 1899-1900, only 1,851 were males. The amount appropriated for the support of the public normal schools by States, counties, or cities during 1899-1900 was \$2,769,003, as compared with \$2,510,934 for the preceding year. One of the most gratifying features of the normal education for that year was the large increase in the number of colored students. Thus, while the total number of students in the public normal schools shows an increase of less than 6 per cent., the number of colored students increased during the same year from 1,138 to 2,707, or nearly 140 per cent. The private normal schools still continue to decrease in number, but the average attendance is considerably higher. Thus the 198 schools in 1896-97 had only 21,293 pupils, while the 134 schools in 1899-1900 had 22,172 students, including 2,250 colored students.

	No. OF SCHOOLS.		No. OF STUDENTS.		COLORED.	
	Public.	Private.	Public.	Private.	Public.	Private.
North Atlantic Division:						
Maine.....	6	...	1,071	.....	8	.....
New Hampshire.....	1	...	118	.....	.....	.....
Vermont.....	9	...	252	.....	.....	.....
Massachusetts.....	10	3	1,770	206	525	.....
Rhode Island.....	1	...	194	.....	1	.....
Connecticut.....	4	...	876	.....	.....	.....
New York.....	16	1	5,987	454	20	.....
New Jersey.....	3	...	789	.....	6	.....
Pennsylvania.....	16	3	6,922	294	12	.....
Total.....	59	7	17,679	963	567	.....
South Atlantic Division:						
Delaware.....	1	...	25	.....	.....	.....
Maryland.....	1	3	392	78	.....	.....
District of Columbia.....	2	2	217	58	109	22
Virginia.....	9	5	323	178	163	77
West Virginia.....	7	2	1,234	152	88	98
North Carolina.....	6	7	923	490	514	300
South Carolina.....	1	4	202	246	246	.....
Georgia.....	2	4	792	180	180	.....
Florida.....	2	2	120	76	28	29
Total.....	25	29	4,228	1,418	902	952
South Central Division:						
Kentucky.....	4	7	810	752	117	40
Tennessee.....	1	12	604	1,005	.....	565
Alabama.....	6	2	847	552	198	562
Mississippi.....	6	6	365	198	287	61
Louisiana.....	2	...	471	.....	.....	.....
Texas.....	3	2	779	176	276	45
Arkansas.....	1	6	62	498	62	.....
Oklahoma.....	3	...	654	.....	27	.....
Indian Territory.....	...	...	.....	.....	.....	.....
Total.....	26	35	4,092	3,191	932	1,273
North Central Division:						
Ohio.....	5	10	575	4,228	5	.....
Indiana.....	2	11	1,327	4,831	3	9
Illinois.....	4	8	2,133	2,250	12	13
Michigan.....	3	2	2,023	167	2	.....
Wisconsin.....	3	2	2,786	66	.....	.....
Minnesota.....	5	2	1,430	66	1	2
Iowa.....	5	10	2,204	1,630	.....	.....
Missouri.....	4	5	1,897	1,193	38	.....
North Dakota.....	2	1	417	35	.....	.....
South Dakota.....	3	1	480	149	1	.....
Nebraska.....	1	3	764	1,255	.....	.....
Kansas.....	1	6	1,501	418	13	.....
Total.....	43	61	17,537	16,498	70	24
Western Division:						
Montana.....	1	...	98	.....	.....	.....
Wyoming.....	...	...	.....	.....	.....	.....
Colorado.....	1	1	377	97	234	1
New Mexico.....	2	...	153	.....	1	.....
Arizona.....	2	...	116	.....	.....	.....
Utah.....	1	...	148	.....	.....	.....
Nevada.....	...	...	.....	.....	.....	.....
Idaho.....	2	...	243	.....	.....	.....
Washington.....	2	...	319	.....	.....	.....
Oregon.....	4	...	531	.....	.....	.....
California.....	4	1	1,920	25	1	.....
Total.....	19	2	3,885	122	236	1
United States.....	172	134	47,421	22,172	2,707	2,250

NORTH CAROLINA, a South Atlantic State of the United States, has an area of 52,250 square miles. The capital is Raleigh. The population in 1900 was 1,893,810, while in June, 1901, as estimated by the government actuary, it was 1,922,000. The populations of the two largest cities in 1900 were: Wilmington, 20,976; and Charlotte, 18,091.

Finance.—The receipts of the treasury for the fiscal year ending November 30, 1901, were \$1,744,659.30; the expenditures, \$1,690,872.73, leaving in the treasury December 1, 1901, \$53,786.57. The State debt was neither increased nor decreased during 1901; it amounted to \$6,527,770, all of which was bonded. The State tax rate for the year (1900-01) was 4.3 mills per \$1.00 valuation, divided as follows: for general revenue, 2.1 mills; for pensions, 0.4 mills; for schools, 1.8 mills; while the total value of State property, as returned for taxation, was \$306,597,715. For 1901-02, the estimated value of taxable property is \$328,597,715.

Industries.—Although North Carolina is an agricultural State, the census reports of 1900 indicate a large growth in its manufacturing interests since 1850. During these years, the population increased from 869,039 to 1,893,810, or 117.9 per cent., while the average number of industrial wage-earners advanced from 14,601 to 70,570, or 383.3 per cent., embracing in 1900 3.7 per cent. of the total population. The amount of actual capital invested in 1900 in mechanical industries, exclusive of capital stock, was \$76,503,894, the gross value of the products, \$94,919,663, and the net value, exclusive of the products re-used in the process of manufacture, \$74,575,155. The manufactures of North Carolina depend upon its natural resources; upon its cotton, tobacco, and wheat fields, and upon its forests. The most important industry is the manufacture of cotton goods, the value of the product in 1900 being \$28,372,798, an increase in value of 196.7 per cent. since 1890, and an advance in rank among cotton manufacturing States from tenth to third. The lumber and timber industry is next in importance, with a product valued in 1900 at \$14,862,593, an increase of 152 per cent. since 1890. Tobacco manufacture is one of the State's best known industries. The product in 1900 was valued at \$13,620,816, an advance since 1890 of 184.7 per cent. Other manufactures of importance are: Flouring and grist-mill products, \$8,867,462; planing-mill products, \$2,892,058; cottonseed oil and coke, \$2,676,871; furniture, \$1,547,305; car construction and shop-work, \$1,571,376; tanning, currying, and finishing of leather, \$1,502,378; and fertilizers, \$1,497,625. Much of the State's output of cottonseed oil is used as a source of ammonia in making fertilizers.

Legislation: Corporation Laws.—By an act approved March 11, 1901, the anti-trust law of 1899 was repealed, and a much more stringent one enacted in its place. By the new law perhaps every business house in the State may be condemned as a trust, for a trust is defined under the act as a combination of two or more persons, companies, or corporations to do or attempt to do any of the following things: (1) To restrict trade in any line; (2) to increase or reduce prices; (3) to prevent competition in producing, selling, purchasing, or transporting goods; (4) to fix a controlling standard price for any article; (5) to enter into agreements not to sell below a certain price or to fix a price or to pool interests so as to affect prices; (6) to sell goods so as to discriminate between the trade of any States or Territories. Corporations found guilty of any of these prohibited actions are to forfeit their charters and their right to do business in the State. Corporations also may be required at any time to swear through their officers that they have not done any of the prohibited things, and if they swear falsely it is to be a criminal offense, and if they refuse to swear at all, the refusal is to be considered as *prima facie* proof against them. But from the provisions of this law farmers and laborers are specifically excluded, it being provided that the law shall not "apply to live stock or agricultural products in the hands of the producer or raiser, nor shall it be understood or construed to prevent the organization of laborers for the purpose of maintaining any standard of wages." Other corporation laws were as follows: The law of 1889 was repealed which prohibited the formation of a corporation with a capital stock exceeding \$1,000,000. An act was passed revising the corporation law of the State. City and street railway companies were required, unless exempted by the North Carolina corporation commission, to use vestibule fronts on their cars from the middle of November to the first of April, and also to use suitable fenders on the cars.

Bills Affecting Minors.—When the suffrage amendment to the State constitution was adopted in August, 1900, designed to eliminate the "agreement and purchasable negro voter," the Democratic party promised to provide such common schools as would allow no excuse for any white boy, arriving at manhood after 1908, being unable to comply with the educational requirements of the suffrage, which would thereafter apply equally to blacks and whites. The constitution requires a school term of not less than four months; but there has never been enough money in the treasury to comply with this provision, and it is said that at least \$500,000 in addition to the appropriations usually made will be necessary for this purpose. The legislature of 1901 appropriated \$200,000 for the schools, of which \$100,000 represented additional appropriations made to fulfill as far as possible the party pledges.

As in Tennessee, bills proposing that the appropriations for negro schools should be restricted to the amount of educational taxes paid by the negroes, were introduced, but so much opposition developed against them, based on the equities and the need of educating the negro, that the bills were pigeon-holed in committee. There was considerable agitation during the session of the legislature for the enactment of a law prohibiting child labor. In large part this agitation was aroused by northern religious and philanthropic journals, which viewed with displeasure the extensive employment of children, both black and white, under 12 years of age in North Carolina. On the other hand, it was represented that the poverty of the State was so great that many of the poorer families could barely subsist even by "leasing out," as it were, their children, and that the cure that would be effected by prohibiting this would be worse than the disease. Representatives, moreover, of practically all the cotton mills in the State presented to the legislature an agreement in which they pledged that no week's work should exceed 60 hours; that no child under 12 should be employed in a mill during the term time of public schools; and that the mills would promote the education of working people in the State and would cheerfully bear their part of the taxation burdens for that purpose. The judiciary committee to which this agreement was referred, stated in its report that the evils of child labor were being rapidly diminished, and recommended that no child-labor law be enacted.

Other Laws.—A law which might conceivably result in grave discordance between the State and federal authorities and whose tendency is to emphasize the anti-Republican feeling in the South was that directing the attorney-general to defend registrars, judges of election, and other persons against whom prosecutions for election frauds are pending in the federal courts of the State, and directing the attorney-general to defend in the same manner any other person who might be so prosecuted "for any act committed by him in the performance of any duty imposed on him by the laws of North Carolina." An act "construing" the State law of libel provides that if a newspaper publishes false statements in good faith and thereafter makes retraction, it shall not be liable in a civil suit for more than the actual damages or in a criminal suit for more than a penny in costs. But persons sending libelous statements to newspapers for publication shall be guilty of a misdemeanor. A law was passed giving the assent of North Carolina to the acquisition by the United States government of such lands in the State as might be necessary for the establishment of the proposed national forest reserve in the high mountain regions of western North Carolina, and adjacent States. A law was passed creating a board of examiners to be appointed by the governor, whose duty it should be to visit and inspect all State institutions, including those supported in part by the State, and to report thereon biennially to the governor, so that the legislature might be kept informed as to the condition, efficiency, and needs of the institutions. The State board of education was constituted a State text-book commission to select and adopt a uniform series of text-books for use in the public schools. An act for the benefit of the agricultural interests of the State provided that land should not be sold for unpaid taxes until all the owner's personal property in the county had been seized and sold by the sheriff to meet the unpaid taxes, and that the land when sold might be redeemed at any time within a year by the payment of taxes, costs, and 20 per cent. interest. Kidnapping was made punishable with imprisonment of not more than 20 years. Congress was applied to under Article 5 of the Constitution to propose an amendment for the direct election of United States senators.

Impeachment Trial.—By a resolution of the North Carolina House of Representatives on February 18, 1901, an impeachment trial was ordered before the State Senate of the chief justice of the State, David M. Furches, and of Robert M. Douglas, one of the associate justices. On March 14, the trial came up before the Senate as directed and was concluded March 28, 1901, by a vote of the Senate acquitting those impeached. The main facts leading up to the trial were as follows: Theophilus White had been appointed by an act of 1897 chief inspector of shell-fish under an act to promote the oyster industry. At this time, the legislature stood: Republicans, 66; Populists, 58; Democrats, 45. Two years later, when the legislature was thoroughly Democratic, it endeavored to legislate Theophilus White out of office by changing the form of the commission, creating seven commissioners and prescribing their duties. The office, however, which Mr. White held was not specifically abolished, because the duties of the office remained although its title was changed. Theophilus White then attempted to draw his salary, and being refused by the State auditor, appealed to the superior court, which rendered a decision in his favor. The case was then taken to the supreme court, which held that while it was competent for the legislature to abolish an office, it was not competent for it to remove the office-holder without cause, for the reason that an officeship constituted property. And the court thereupon issued a peremptory order to the auditor of the State to pay Theophilus White his salary. This action of the court vexed the legislature exceedingly, not only because it appeared to them that the supreme court was en-

deavoring, in at least one important particular, to supersede the legislature, but also because the legislature had in 1899 endeavored to legislate out of office in a similar way Mr. D. H. Abbott, railway commissioner, and the court had similarly decided against the legislature. The decision of the court was divided, three of the five judges deciding in favor of Theophilus White; of the three, however, one, Justice William T. Faircloth, died before impeachment proceedings were instituted. Against the remaining two justices who had rendered an opinion adverse to their interests, the House drew up five indictments. After a full hearing, the judges were acquitted on all the charges, owing to the inability of the Senate to muster a two-thirds vote as required by the constitution. The vote on the first charge of the indictment stood 27 for conviction and 23 for acquittal. On the four remaining charges there was a majority in the Senate for acquittal. The case aroused wide interest throughout the State as it was practically admitted that political reasons, directly or indirectly, were at the bottom of the indictment charges.

Elections.—On January 22, 1901, the legislature of North Carolina elected Furnifold M. Simmons, of Raleigh, chairman of the Democratic State committee, as United States senator for the full term ending March 4, 1907. Mr. Simmons was nominated at the State primary in November, 1900, and succeeded Marion Butler, Populist. Mr. Butler in turn had succeeded Matthew W. Ransom, United States senator from 1872 to 1895. Mr. Butler's success in defeating Mr. Ransom was due to the fact that in 1895 North Carolina had turned strongly Populist, while Mr. Ransom remained a Cleveland Democrat. The defeat of Mr. Butler in 1901 marked the return of the State to the regular Democracy, there being in the State legislature of 1901 only five Populists all told.

State Officers.—Elected 1900, serving from January 1, 1901, to January, 1905: Governor, C. B. Aycock, Democrat; lieutenant-governor, W. D. Turner; secretary of state, J. Bryan Grimes; treasurer, B. R. Lacey; attorney-general, R. D. Gilmer; superintendent of education, Thomas F. Toon; insurance commissioner, James R. Young; auditor, B. F. Dixon.

Supreme Court: Chief justice, David M. Furches, Rep.; associate justices, Robert M. Douglas, Rep.; Walter Clark, Dem.; W. A. Montgomery, Dem.; Charles A. Cook, Rep.

Congressional Representatives (57th Congress).—In the House—John H. Small, from Washington; Claude Kitchin, from Scotland Neck; Charles R. Thomas, from Newbern; Edward W. Pou, from Smithfield; William W. Kitchin, from Roxboro; John D. Bellamy, from Wilmington; Theodore F. Klutz, from Salisbury; Spencer Blackburn, from Winston; and J. H. Moody, from Waynesville—all Democrats, except Spencer Blackburn and J. H. Moody. In the Senate—Jeter C. Pritchard (until 1903), from Marshall, Republican, and F. M. Simmons (until 1907), from Newbern, Democrat.

NORTH CAROLINA, UNIVERSITY OF, founded in 1795, a State institution located at Chapel Hill, N. C. In 1900-01 there were 59 instructors and 564 students in all departments. During the year 7 new professorships were created, 4 of which were filled. The university has \$100,000 in productive funds, and during the past year the State appropriation was increased from \$25,000 to \$37,500. The permanent equipment of the university was also increased during the year by the addition of a new dormitory, a central heating plant, and a building for lectures, at a total cost of \$87,500. The library, containing 32,000 volumes, was completely reorganized during the past year.

NORTH DAKOTA, a northwestern State of the United States, has an area of 70,795 square miles. The capital is Bismarck. The Territory of Dakota was organized March 2, 1861, and on November 2, 1899, was divided and formed into the States of North and South Dakota. The population of North Dakota in 1900 was 319,146, while in June, 1901, as estimated by the government actuary, it was 333,000. The populations of the two largest cities in 1900 were Fargo, 9,589; and Grand Forks, 7,652.

Industries.—Although the principal industries of North Dakota are agriculture and stock raising, the census reports of 1900 show an increase in manufacturing interests during the past decade. In that time, the population has increased from 182,719 to 319,146, or 70.9 per cent., and the average number of industrial wage-earners from 1,499 to 2,398; aggregating in 1900 0.8 per cent. of the total population. The amount of actual capital, exclusive of capital stock, invested in 1900 in 1,130 establishments reporting, was \$5,396,490, the gross value of products, inclusive of materials re-used in the process of manufacture, \$9,183,114. Manufacturing is limited almost entirely to "neighborhood" industries, and, except in the case of flour and grist-milling, practically the entire product is consumed at or near the point of production. During 1900, the output of the latter industry was valued at \$4,134,023, or 45 per cent. of the total value of the product of the State.

Legislation.—The North Dakota legislature met on January 8, 1901, and adjourned March 8. Among the various laws passed may be mentioned the following: Amend-

ments were made to the existing divorce laws so that North Dakota should no longer be criticised for its laxity in the matter of granting divorces. To the law providing that "the effect of the judgment decreeing a divorce is to restore the parties to the state of unmarried persons," was added in 1901 the qualification "except that neither party may marry within three months." Although the legislature did not modify another divorce law which decreed that divorces might be obtained for desertion, cruelty, intemperance, and for various other reasons, yet the legislature did add in 1901 that divorce could no longer be granted for "incurable insanity." An act was passed making it a misdemeanor to sell adulterated or unwholesome food or food which is an imitation of another food so that the product deceives the purchaser. The special intent of this law was stated to be the curtailment of the trade in oleomargarine. It is provided that the State board of equalization shall assess, at their actual value for the purposes of taxation, the franchise and property within the State of telephone, telegraph, express, freight line, and equipment companies. Another tax act provided that the board of equalization should in 1902 and annually thereafter, levy a tax in addition to all other taxes equal in amount to one-thirtieth of the bonded indebtedness of the State, so as to provide for its ultimate redemption. A law similar to one declared unconstitutional in Illinois in 1900, provided that every railroad operating within or through the State should stop all its passenger trains at every county seat, except that interstate trains need not stop at county seats of less than 500 inhabitants. Another railroad law of doubtful constitutional validity requires railroads to keep stations open at all sidings where there are as much as \$25,000 worth of merchandise shipped each year. Religious property was made exempt from State taxation for the first time, although property used for charitable or educational purposes had previously been exempt. But by the law of 1901 property used for religious purposes is to be only partially exempt; that is to say, personal property is to be exempt and real property not to exceed one acre, provided that it had been built upon. A libel law enacted that a newspaper should only be liable for actual damages if it appeared on trial that the libel had been published in good faith and had been retracted when shown to be false. But if the libel had been against a candidate for any political office, then the retraction must also have been made editorially at least three days before the election. A novel feature of this law is that which makes a libel against any woman not only a civil but also a criminal offense. A State farmer's institute was created to arrange for and hold not less than 15 farmers' institutes in each year, at which the farmers should be instructed in maintaining the fertility of the soil, improving cereal crops, in dairying, and in stock raising. Another act on behalf of the farmers, provided that the county commissioners in any county might, upon the application of 100 or more freeholders of that county, issue county bonds to buy and distribute wheat and grain seed to the farmers, the cost of the seed to act as a first lien upon the farmers' crops. But this act was only to go into effect if the previous crops had failed or partially failed because of hail, snow, or drought. An act for the regulation of barbers provided for the appointment of a board of examiners to issue certificates to barbers to practice their trade, on proof that they had practiced in schools or as apprentices for not less than three years, were possessed of the requisite skill, and had also sufficient knowledge regarding the common diseases of the skin to avoid the exaggeration and spreading thereof in the practice of their trade. The law of 1895, giving a bounty of \$1 on every 100 pounds of starch manufactured from potatoes grown in North Dakota, was repealed on the ground that the financial interests of the State required strict economy. The punishment for kidnapping was raised from a maximum of 5 to a maximum of 20 years' imprisonment.

State Officers.—Holding office in 1901, through 1902, ending in January, 1903: Governor, Frank White, Republican; lieutenant-governor, David Bartlett; secretary of state, E. F. Porter; treasurer, D. H. McMillan; auditor, A. N. Carlbloom; attorney-general, O. D. Comstock; superintendent of education, J. N. Devine; commissioner of agriculture, R. J. Turner; commissioner of insurance, Ferdinand Leutz; commissioner of public lands, D. J. Laxdahl.

Supreme Court: Chief justice, term six years, ending January, 1903, Alfred Wallin; associate justices, N. C. Young and D. E. Morgan—all Republicans.

Congressional Representatives (57th Congress).—In the House—Thomas F. Marshall, Republican, from Oakes. In the Senate—Henry C. Hansbrough (until 1903), from Devils Lake, and Porter J. McCumber (until 1905), from Wahpeton—both Republicans.

NORTHWEST TERRITORIES, a political division of the Dominion of Canada, composed of the following districts: Assiniboia, Saskatchewan, Alberta, Keewatin, Athabaska, Mackenzie, Ungava, and Franklin. The total area is estimated at upwards of 2,300,000 square miles. The population, according to the census of 1901, was 158,940, as against 66,799 in 1891, showing an increase of nearly 238 per cent. Capital, Regina, in the district of Assiniboia, with a population of about 2,000. Secular education is compulsory. The number of public schools shows an increase

from 453 in 1899 to 492 in 1900, and the enrollment rose during the same period from 18,801 to 20,343. The territories are administered by a lieutenant-governor and an executive council of three members selected by the governor from among the members of the assembly. This body consists of 31 members elected by popular vote. In the Dominion Parliament the territories are represented by 2 members in the Senate and 4 in the House of Commons. Owing to the cold climate and sparse settlement of the territories, agriculture and stock-raising are unimportant; the territory of Alberta, with its more favorable climate, is the centre of the stock-raising industry. The coal deposits of the territories are believed to be very extensive, but so far they have been worked only on a small scale. The mining of gold is confined chiefly to the separate territory of Yukon. Imports and exports of the territories, including Yukon, for 1900 were \$3,779,961 and \$9,441,804 respectively. The value of the imports of United States products to the territories (including Yukon) during 1900 was \$3,586,168. By the end of the fiscal year 1900, the territories had 1901 miles of track laid. In 1901 the government telegraph lines had a total length of 698 miles (excluding the Yukon lines). The government telegraph line into the Yukon was completed in 1901. The officially estimated value of the year's production of gold in the Klondike district was \$25,000,000. In the foundering of the steamship *Islander* off Douglas Island on August 15, 1901, during the voyage to Vancouver, B. C., 65 lives were lost and \$1,000,000 worth of Klondike treasure.

NORTHWESTERN UNIVERSITY, Evanston, Ill., chartered 1851. The number of students in the degree-conferring departments during the academic year 1900-01, was, not counting duplicate names, 2,246, distributed as follows: College of liberal arts, 643; medical, 345; law, 195; pharmacy, 176; dental, 500; woman's medical, 63; theological, 198; music, 162. These figures show a decrease of 112 from the total for 1899-1900; but the figures for the academic year 1901-02 show a total of 2,425, distributed as follows: College of liberal arts, 640; medical, 408; law, 175; pharmacy, 177; dental, 600; woman's medical, 80; theological, 175; music, 170. The woman's medical school is to be discontinued at the close of the academic year 1901-02. Chaplin Hall for women, erected by Mr. D. K. Pearsons, of Chicago, was completed September 25, 1901. It provides accommodation for 60 women. During 1901 the endowment of the university was increased by a gift of \$90,000, making the total endowment \$6,600,000. The discussion as to the reduction of the number of baccalaureate degrees was continued during the year, the disposition of the faculty being to extend the elective system, simplify and unify the courses of instruction, and then grant but a single degree, that of B.A. In the medical school for men, the most important changes during 1901 were the introduction of ward visits and small clinics in the hospital for the senior class, the introduction of a four months' course in experimental surgery in the work of the junior year, and the addition of a fifth year for graduates in medicine who wish to do advanced work in a hospital. This graduate year is to consist of three months' work in medicine, surgery, obstetrics, and pathology, respectively, under the supervision of a member of the faculty who sustains to the student a relation similar to that of preceptor. The requirements for admission to the medical school are the possession of a degree from a college, or of a diploma from a high school. A number of new courses are offered, and the course of study for the B.S. degree has been greatly modified. A large amount of engineering work has been introduced, so that a student may complete his course in engineering in two years after completing the work for the B.S. degree. The library on May 1, 1901, contained 45,764 bound volumes and 30,300 pamphlets, the increase for the year being 2,582 bound volumes and 3,294 pamphlets.

NORWAY, a kingdom of northern Europe, has an area of 124,445 square miles, and a population, according to the decennial census of December 3, 1900, of 2,231,395, the increase for the decade being 230,478. Christiania, the capital and largest city, according to official estimate, has a population of 227,600.

Government.—The legislative power rests with the *Storting*, consisting of 114 members, elected by indirect suffrage; it is divided into two sections, the *Lagthing* and the *Odelsthing*. The executive authority is vested in the king, who exercises his authority through a council of state, composed of two ministers of state and seven or more councillors. The king is Oscar II., who succeeded to the thrones of Norway and Sweden (*q.v.*) in 1872. The diplomatic and consular services are maintained in common with Sweden, the efforts of Norway to separate the two kingdoms, in these functions, having thus far failed.

Army and Navy.—The standing army consists of 18,000 men of the line, and cannot be increased without the consent of the *Storting*, but additional forces under various names bring the total number of men available for service outside the kingdom up to 31,000. The reserves and militia (*Landsturm* and *Landvaern*) number about 50,000. All young men over 22 years old are liable to conscription. The navy, which like that of Sweden is maintained solely for coast defense, consists of 22 small

cruisers, gunboats, and monitors, and 33 torpedo boats, with a total complement of 5,150 officers and men.

Finance.—The monetary standard is gold and the unit of value the krone (26.8 cents). The budget for the fiscal year ending March 31, 1901, balanced at 99,641,070 kroner. The principal sources of revenue were: Customs, 35,000,000 kroner; state railways, 12,224,200 kroner; excise on spirits and malt, 8,300,000 kroner; posts and telegraphs, 7,450,000; and income tax, 5,100,000. The chief items of expenditure were: State railways, 22,036,470 kroner; army and navy, 18,900,000 kroner, and church and education, 9,117,000 kroner. The budget estimates for the fiscal year 1902 placed the receipts at 102,500,000 kroner, and the expenditures at 100,800,000 kroner. It was stated as probable that the excess of 1,700,000 kroner would be expended on defense.

Products and Industries.—Although the number engaged in agriculture is greater than in any other industry, only 3 per cent. of the total area is under cultivation, and the agricultural exports are insignificant, while food products are largely imported. Wheat, barley, rye, pulse, oats, and potatoes are among the agricultural products, and horses, cattle, swine, and sheep are raised. The fisheries products amounted in 1900 to 55,000,000 kroner; the timber and wood products, including pulp and paper stock, were valued at over 100,000,000 kroner. The latter industry is supported by 26,000 square miles of forest, three-fourths of it being pine. The mineral products are unimportant, the entire output of the kingdom being in 1898 less than 3,800,000 kroner.

Commerce.—Timber and fish products constitute two-thirds of the exports. Beside these, the important exports include paper, ships, condensed milk, and metals. The foreign trade for 1900 approximated a value of 533,000,000 kroner, including imports of over 340,000,000 kroner, and exports exceeding 190,000,000 kroner. The balance of trade against the kingdom was greater than any previous year had shown, but was partially offset by the earnings of the merchant marine, and the income from visiting tourists. The Norwegian foreign trade has increased in some quarters, notably with the United States, Africa, and Australia, with which countries it has trebled, and with Belgium, with which it has quadrupled. It has gradually increased with Great Britain; but has declined with France and with Sweden, in the latter case owing partly no doubt to the anti-Swedish political agitation in the country.

Communications.—A considerable part of Norway's foreign commerce is carried in vessels bearing her flag. In 1901 the number of these, together with all ships in domestic service of more than 100 tons burden was 2,321, with a total tonnage of 1,627,220, being exceeded by the shipping lists only of the United States, Germany, and Great Britain. In 1900 there were, in Norway, 1,163 miles of railway open to traffic, and telegraph lines aggregating 7,464 miles in operation.

History.—A ministerial crisis which threatened in April, 1901, was averted by the king. The Commission of National Defense reported in that month in favor of the construction of a line of fortifications along the Swedish frontier and the report was adopted by the Liberal ministry, which made provision in the budget for the necessary expenditure. Opposition was immediately aroused among the Conservatives, who declared themselves unalterably against a project so plainly menacing to Sweden. The matter was laid before King Oscar, who on April 21, contrary to expectations, expressed himself as favorable to the expenditure, whereupon the opposition collapsed. On May 8, 1901, after striking out the provisions for obligatory military service, the *Storting*, in joint session, passed the ministerial army reorganization bill, entailing an expenditure of 22,500,000 kroner. The *Odelsting*, on May 10, passed a bill reforming the franchise in local or town elections, which granted universal suffrage to men and extended it to all women who paid taxes on an annual income of 300 kroner or personal property of 400 kroner. The *Lagthing* a few days later rejected the provision for woman suffrage, but upon the bill coming before the two houses in joint session it was passed as originally introduced. During 1901 the government undertook extensive harbor improvements at Victoria, a port in the northern part of the peninsula, which is the natural port of shipment for the recently discovered mines of Lapland. It is proposed to expend 4,000,000 kroner.

NOVA SCOTIA, a province of the Dominion of Canada, has an area of 20,600 square miles, and, according to the census of 1901, a population of 459,574, as against 450,396 in 1891, showing an increase of less than 2 per cent. Capital, Halifax, with a population of 40,787 in 1901. The number of public schools at the end of the fiscal year 1900 was 2,417, with a total enrollment of 100,129. The schools are maintained partly by government grants and partly by municipal aid.

Government and Finance.—Nova Scotia is administered by a lieutenant-governor, assisted by an executive council. There are two legislative chambers, a council of 21 members and an assembly of 38 members. In the Dominion Parliament the province is represented by 10 members in the Senate and 20 members in the House of Commons. The revenue and expenditure for the fiscal year 1900 were \$1,014,123 (\$876,828 in 1899) and \$937,261 (\$852,379 in 1899) respectively. The gross debt at

the end of the calendar year 1900 amounted to \$4,059,518, as compared with \$3,808,813 at the end of the preceding year.

Industries, Commerce, etc.—The principal industry is mining, and the chief mineral product coal. Out of 5,332,197 short tons of coal produced in the entire Dominion in 1900, Nova Scotia contributed 3,626,628 tons (3,148,822 in 1899), valued at \$5,947,670. The output of gold for the same year amounted to \$607,152, as compared with \$617,604 in the preceding year. At the end of 1900 the Dominion Iron and Steel Company opened its plant at Sydney, Cape Breton, and present conditions indicate that this will greatly affect the industrial development of the province. Nova Scotia not only has the largest coal output of the Dominion, but also yields the largest catch of fish. The value of the catch for 1899 (latest statistics available) was \$7,347,134, or 33 per cent. of the total value of the output for the entire Dominion. The leading values were: Cod, \$2,530,600; lobsters, \$1,639,790; and mackerel, \$644,864.

The figures for the trade of Nova Scotia in 1900 are of an encouraging nature. The imports for that year amounted to \$10,646,716, as compared with \$7,425,140 in the preceding year, while the exports increased from \$11,488,120 in 1899 to \$12,608,973. Of the total imports of 1900, \$7,193,467 represented United States produce. Nova Scotia has a larger merchant marine than any other province in the Dominion. In 1900 it consisted of 2,121 steamers and sailing vessels, with a total net tonnage of 226,817.

At the end of the fiscal year 1900, Nova Scotia had 927 miles of railway track laid. The subsidies granted to private railways by the provincial government and the municipalities up to the end of the fiscal year 1900 amounted to \$3,104,876. The government telegraph lines had a total length of 298 miles at the end of the calendar year 1900.

History.—During the session of the provincial legislature in 1901, a subsidy was granted for the building of a railway along the south shore from Halifax to Yarmouth; the establishment of a Maritime College of Agriculture and Horticulture, with dairy schools in each county; and an act was passed to grant, upon a five-eighths' vote of the tax payers, a bonus not exceeding \$100,000 to enable any town or city in the province to aid in the establishment of a manufacturing or ship-building industry. The result of the October election for the choice of members of the provincial legislature was an overwhelming Liberal majority of 36 seats to 2 seats for the Conservatives.

NURSES, TRAINED. King Edward conferred, in 1901, the decorations of the Royal Red Cross upon Miss Marian Lambert, of the Church of England Mission; Sister Jessie M. Ransome, Miss Lillie E. Saville, M. D., London Mission; and Miss Abbie G. Chapin, in recognition of valuable services at the International Hospital during the siege of the legations in Peking. In March, 1901, Secretary of War Root appointed Mrs. Dora Hopkins Kinney, of New York City, superintendent of the female nurse corps of the United States Army, under the reorganization act. Mrs. Kinney had been superintendent of nurses at Boston and at the Long Island Hospital, and also had experience in connection with hospitals in St. Paul, and San Francisco, and in New Mexico. When a hospital was proposed at Nagasaki, Japan, during the Chinese imbroglio, she was selected for appointment as superintendent.

OATS. The world's oat crop for 1900 is stated in bushels as follows:

Countries.	Bushels.	Countries.	Bushels.
Russia	812,791,000	Sweden	69,272,000
United States	809,126,000	Denmark	35,000,000
Germany	488,594,000	Australia	25,293,000
France	252,878,000	Belgium	20,000,000
Austria-Hungary	193,000,000	Other countries.....	105,589,000
United Kingdom	170,342,000		
Canada	113,612,000	Total.....	3,095,497,000

The oat crop of the United States in 1901 is estimated by the *American Agriculturist* at 701,000,000 bushels, valued at \$210,000,000. The exports from and the imports to the United States in the fiscal year ending June 30, 1900 and 1901, are estimated by the section of foreign markets of the Department of Agriculture, as follows:

Countries from which Imported.	1900.		1901.	
	Bushels.	Value.	Bushels.	Value.
Canada	40,943	\$17,910	19,454	\$8,028
United Kingdom	507	385	1,239	942
Other countries	73	65	42	25
Total	41,523	\$18,360	20,735	\$8,995

Countries to which Exported.	1900.		1901.	
	Bushels.	Value.	Bushels.	Value.
United Kingdom	22,242,875	\$6,771,925	21,482,005	\$6,684,341
France	4,460,355	1,257,541	4,905,576	1,515,856
Belgium	2,910,775	885,979	2,921,251	898,749
Netherlands	6,393,728	1,911,606	2,057,106	657,593
Germany	1,295,609	394,108	1,911,326	642,032
Philippine Islands	327,741	126,553	1,257,662	546,269
Other countries	3,738,332	1,156,942	2,611,886	820,490
Total	41,369,415	\$12,504,654	37,146,812	\$11,765,330

The average price of oats in the Chicago market in 1901 was 32 cents a bushel. The Iowa Experiment Station has had good results from cutting back oats to prevent lodging. On the recommendation of this station farmers are now seeding clover with oats as a nurse crop. It gives a good catch and stand of clover. W. Stuart, of the Indiana Experiment Station, has reported the results of 3 years' observation on the use of formalin as a means for the prevention of oat smut. Comparisons were made between hot water and formalin for the prevention of oat smut, in which the hot water proved entirely efficient, seed treated 10 minutes at 135° F. being wholly without smut, while those soaked in formalin solutions showed a few smutted plants. The efficiency of the formalin was thoroughly established, and the ease with which it may be applied renders it preferable to the hot water treatment. Considerable variation was found in the strength of the formalin sold by chemical supply firms; but the formalin purchased in bulk was equally valuable with that put on the market in pound bottles. Mr. Stuart recommended the use of a 1.6 formalin solution in which seed is soaked from 1 to 2 hours, or one-half hour soaking in a 1.45 solution. The effectiveness of formalin as a preventive of oat smut has also been reported by a number of other experiment stations.

OBERLIN COLLEGE, at Oberlin, O., founded 1833. The attempt to complete the half-million dollars of additional endowment by the close of 1901 (through Mr. John D. Rockefeller's conditional offer of \$200,000), is to be followed by an earnest effort to obtain a million dollars more. Oberlin, at the time of the president's annual report in March, 1901, had a funded endowment of about \$705,000, besides \$140,000 in funds now carrying annuities; and buildings and grounds valued at \$650,000. Two new buildings, the Severance Chemical Laboratory and the Warner Men's Gymnasium, were being constructed, making an added value of \$100,000. A number of smaller gifts and scholarships were received in the collegiate year 1900-01. In February, 1901, the faculty recommended to the trustees that thenceforth only one degree be given in the Arts course. The library comprises about 52,000 volumes and about the same number of pamphlets. Faculty, 93; students, 1,129, including 421 in the college, 43 theological seminary, 353 conservatory of music, 27 art school, and 285 preparatory academy. The proportion of men to women, which has remained about the same for three years, is 39 per cent.

OBESITY. It was Liebig who first perceived that nutritional disorder caused improper deposition of fat. The method of Dr. Harvey, used in reducing Louis Banting, has been known by the patient's name from the time it was extensively used on the Continent as well as in England. Ebstein's method was a modification of Harvey's. Oertel bases his method on a decrease in the supply of liquids, a substitution of carbohydrates for fats in the diet, and a methodical increase of the working power of the muscular apparatus. The Banting method is unsafe for many people, because it consists in the use of a large quantity of meal and a small quantity of carbohydrates; and such a diet is very injurious to gouty subjects and to those with kidney disorders. Ebstein's method allows much albuminous and fatty food, but lessens the amount of carbohydrates. It may be adaptable for milder cases of obesity. The reduction of the consumption of fluids and the adaptation to each patient of the proper quantity of albuminous food, as advocated by Oertel, and also by Schwenninger (who reduced the weight of Prince Bismarck with rapid success), has proved valuable in most cases. Muscular exercise, massage, out-of-door sports, together with measures favoring oxidation, such as hydrotherapy, balneotherapy, and calisthenics are useful adjuvants. Consult Oertel on "Obesity," in *Twentieth Century Practice of Medicine*, vol. II., p. 625, New York, 1895.

OBOCK. See SOMALILAND.

OCHRE. See MINERAL PAINTS.

ODD FELLOWS, INDEPENDENT ORDER OF, organized in England in 1812 and in the United States in 1819, reported in 1901 a male membership in forty-nine States and Territories in the United States and six Canadian provinces of 910,128, while the male membership in Australasia, Germany, Denmark, Sweden, Switzerland, and the Netherlands was 34,244. The encampment branch of the

order had at the same time a membership of 135,209; Rebekah lodges, sisters, 217,944; brothers, 132,489; chevaliers of the patriarchs militant, 15,573. The total relief paid by the order to the close of December, 1900, was \$3,876,927. Number of brothers relieved, 112,764, to the amount of \$2,928,028; widows and orphan families relieved, 5,674, to the amount of \$143,840; for the education of orphans, \$83,205; and for the burial of deceased members, \$751,823. The next meeting of the sovereign grand lodge will be held at Des Moines, Ia., September 15-20, 1902. Grand sire, A. C. Cable, Covington, O.; grand secretary, J. Frank Grant, Baltimore, Md.

OHIO, an east central State of the United States, has an area of 41,060 square miles. The capital is Columbus. Ohio was organized as a State, November 29, 1802. The population in 1900 was 4,157,545, while in June, 1901, as estimated by the government actuary it was 4,212,000. The populations of the five largest cities in 1900 were: Cleveland, the seventh largest city in the United States, 381,768, an increase of 120,415 since 1890; Cincinnati, 325,902; Toledo, 131,822; Columbus, 125,560; and Dayton, 85,333.

Finances.—At the beginning of the fiscal year ending November 15, 1901, there was in the treasury, \$1,520,910.73. The receipts for the year were \$8,036,428.59, and the disbursements, \$7,873,615.78, leaving a balance November 15, 1901, of \$1,683,723.54, credited as follows: General revenue fund, \$1,226,664.46; sinking fund, \$204,316.91; school fund, \$138,391.51; university fund, \$114,350.66. During the year, \$250,000 of the funded debt was paid, leaving the debt at the close of the year, \$451,665.

Industries.—From the preliminary reports of the census of 1900, it appears that there has been a large growth in the manufacturing industries of Ohio within the last decade. In 1890 there was invested in the 28,673 manufacturing establishments reporting, a capital exclusive of capital stock, of \$402,793,019, while in 1900 the number of establishments had increased to 32,398, and the total capital invested to \$605,762,566. The capital invested in the latter year was distributed as follows: In land, \$49,629,109; in buildings, \$94,493,965; in machinery and implements, \$158,986,928; and in cash and sundries, \$302,652,564. At the same time the number of salaried officials and clerks was 30,003, drawing salaries amounting annually to \$29,351,045. The total number of wage-earners was 345,869, drawing wages amounting to \$153,955,330. Of the wage-earners, 287,789 were men drawing annual wages of \$140,364,129, 53,711 were women drawing wages of \$12,883,284, and 4,369 were children under 16 drawing wages of \$707,917. The gross value of the products of manufactures in 1900 was \$832,438,113. This shows a large increase from 1890, when the total value of the products was \$641,688,064. In 1900 the cost of materials used in manufactures was \$447,525,677, while miscellaneous expenses aggregated \$69,728,206. Both in 1890 and in 1900 Ohio was the fourth State of the Union in population, and the fifth State in the financial importance of its manufacturing industries.

Democratic Convention.—The Ohio Democratic State Convention met on July 10, 1901, and nominated James Kilbourne, of Columbus, for governor. The proceedings of the convention were watched with much interest all over the country, not only because this was the first important convention held since the November elections, but also because of the widespread proposals to reorganize the Democracy by dropping out Mr. Bryan and free silver. In 1899 the State convention had warmly indorsed the Chicago platform of 1896, especially its free silver plank and had expressed entire confidence in Mr. Bryan. For this reason the sweeping change of front made by the convention of 1901 was regarded as of especial significance. The platform made no mention of the national platform of 1896 or 1900 or of silver, and a resolution offered to the convention "to reaffirm the Kansas City platform and express renewed confidence in William J. Bryan" received only six votes in a body composed of 950 delegates. While the Republican policy was condemned, care was taken to avoid sheer denunciation; trusts were objected to, both because they tended to crush out individual enterprise, and because they promoted a Socialistic spirit among the people; extension of the national boundaries was opposed when it was not intended to give full political rights to the people annexed; and tariff reform was urged, including the placing of products of trusts upon the free list. On the subject of the control of public utilities by the State, the platform demanded that no franchises or extensions or renewals of them should be granted except upon a previous affirmative vote of the people. Public service corporations should be required by law to make sworn public reports, and the power and duty of visiting and reporting upon these corporations should be conferred upon the State officers, in order that the true value of their privileges should be made manifest. The platform further declared that "steam and electric railroads and other corporations possessing public franchises shall be assessed in the same proportion to their salable value as are farms and city real estate."

Republican Convention.—The Republican State convention of Ohio met on June 24, 1901, and renominated for governor the Hon. George K. Nash. Partly because

Ohio was the President's State and partly to take the edge from Democratic insistence on State issues, the platform adopted consisted largely of a recapitulation of the successes and achievements of the administration. The Republican party, the narrative stated, has "revived industry," "established the gold standard," given the principle of protection its "most signal triumph," "enacted the most generous pension legislation ever known," driven Spain "forever from the Western Hemisphere," "added new glory to American arms and American diplomacy," made Porto Rico "flourishing," snuffed out "a wicked insurrection" in the Philippines, put Hawaii in the path of "marvelous progress," and "all these beneficent results have been accomplished by the enactment into law of Republican principles." Additional reciprocity treaties were urged, the construction of an Isthmian Canal, and such legislation as would restore to preeminence the American merchant marine. But the most striking plank of the platform and the most important, if it could be taken to indicate a dawning policy on the part of the administration and was not inserted merely to render absurd the Democratic dictum of the "consent of the governed," was that denouncing the attempt of the South to deprive the negro of the ballot. "We call," said this plank, "for federal legislation which shall secure the strict enforcement of constitutional measures guaranteeing to every citizen the right of franchise without distinction as to race, color, or previous condition of servitude. And we demand that representation in Congress and in the electoral college shall be based on the actual voting population as provided in the constitution, proportionate reduction being made for any State in which the right of suffrage is denied except for crime." On State issues the platform advocated a revision of the tax laws so as to require all classes of property to bear their just share of taxation, and also the creation of a board to fix and correct, from time to time, assessable values.

Elections.—At the elections in November, 1901, George K. Nash was reelected as Republican governor and the remainder of the Republican ticket was also elected. The number of votes cast for George K. Nash was 436,092, and for his opponent, James Kilbourne, 368,525, thus giving Governor Nash a plurality of 67,567. Although the whole vote cast was only 840,147, as against 1,040,073 in 1900, the plurality in 1900 was less than 2,000 larger than in 1901. So far as this result had any connection with national politics it should be noted that the death of President McKinley, calling forth universal sympathy and eulogy, would naturally have brought out an unusually large Republican vote; but on the other hand the Republican leaders insisted throughout the campaign that the questions at stake looked toward the future rather than the past and that the result of the elections would show a vote of confidence, or the lack of it, in President Roosevelt in the continuance of the Republican policy. And an added significance was lent the result from the fact that the senators from Ohio, Mr. Marcus A. Hanna and Mr. Joseph B. Foraker, were deeply committed to what may perhaps be termed extreme Republican measures, as for example, the passage of the Ship Subsidy Bill, and the continuance without modification, and practically without reciprocity, of a high protective tariff.

State Officers.—Governor, George K. Nash, Republican, for term ending January, 1904; lieutenant-governor, Carl L. Nippert; secretary of state, Lewis C. Laylin; treasurer, Isaac B. Cameron; auditor, term four years, W. D. Guilbert; attorney-general, John M. Sheets; commissioner of education, Lewis D. Bonebrake; secretary of agriculture, W. W. Miller; commissioner of insurance, A. T. Verry.

Supreme Court: In 1901—Chief justice, Thaddeus A. Minshall; associate justices, Marshall J. Williams, Jacob F. Burket, William T. Spear, William Z. Davis, and John A. Shauck—all Republicans. In 1902—Chief justice, Marshall J. Williams; associate justices, Jacob F. Burket, William T. Spear, William Z. Davis, John A. Shauck, and James L. Price—all Republicans.

Congressional Representatives (57th Congress).—In the House—William B. Shattuc, from Cincinnati; Jacob H. Bromwell, from Cincinnati; Robert M. Nevins, from Dayton; Robert B. Gordon, from St. Mary's; John S. Snook, from Paulding; Charles Q. Hildebran, from Wilmington; Thomas S. Kyle, from Troy; William R. Warnock, from Urbana; James H. Southard, from Toledo; Stephen Morgan, from Oak Hill; Charles H. Grosvenor, from Athens; Emmett Tompkins, from Columbus; James A. Norton, from Tiffin; William W. Skiles, from Shelby; Henry C. Van Voorhis, from Zanesville; Joseph J. Gill, from Steubenville; John W. Cassingham, from Coshocton; Robert W. Taylor, from Lisbon; Charles Dick, from Akron; Jacob A. Beidler, from Cleveland; and Theodore E. Burton, from Cleveland—all Republicans except Robert B. Gordon, John S. Snook, James A. Norton, and John W. Cassingham, Democrats. In the Senate—Joseph B. Foraker (until 1903), from Cincinnati; and Marcus A. Hanna (until 1905), from Cleveland—both Republicans.

OKAPI. See MAMMALOGY.

OKLAHOMA, a southwestern Territory of the United States, has an area approximately of 38,830 square miles. The capital is Guthrie. The Territory was organized May 2, 1890. The population in 1900 was 398,331, while in June, 1901, as

estimated by the government actuary, it was 432,000. The largest cities in 1900 were Oklahoma City, with 10,037 inhabitants; and Guthrie, 10,006 inhabitants.

Finance.—The total valuation of all property in the Territory as returned for taxation in 1901 was \$60,464,696, an increase of \$11,126,035 over 1900; and, as in 1900, the taxable value of the property was not more than one-third of the real value. The territorial indebtedness on June 30, 1901, amounted to \$466,220.13, or about \$1.00 per capita, exclusive, however, of \$100,000 incurred in the erection of the Northwestern Normal School, provision for the payment of which was made at the last legislative session. The tax levy for 1901 was 7.5 mills, the increase over the levy of 5.15 mills in 1900, being wholly for the erection of buildings for the various educational institutions of the Territory.

Mineralogy.—Oklahoma is preeminently an agricultural and grazing country, and though indications have not been wanting that valuable mineral resources existed, especially in the Wichita range of mountains, little attention has been paid to them. Surface sandstone and gypsum are widely distributed over Oklahoma, the former being much used, in connection with freely occurring granite, for building purposes. Gold, zinc, lead, and copper have been found, but hardly in paying quantity. During the oil excitement all through the southwest of the United States in 1901, enough oil was found in Oklahoma to insure that further researches will be made. Generally speaking, however, oil, gas, and coal are found too far below the surface to pay for their mining, especially in view of the great oil fields of Texas on the one hand and the coal fields of Indian Territory on the other. The most promising mine industry of Oklahoma seems to be that of salt, of which commodity it is declared there is enough readily at hand to supply the nation. In Salt Creek, near the centre of the Territory, it is estimated that from 40 to 60 carloads of salt flow away a day, and the brine is so strong that by simple evaporation half its weight is yielded in salt 99 per cent. pure. This industry is already carried on to the extent of several thousand barrels a day, and although there is an unlimited supply of salt in the neighboring State of Kansas, there is said to be no reason why, with improved manufacturing methods, Oklahoma salt should not be brought into competition with that of Kansas, at a good profit.

Industries.—Although the census reports of 1900 show a large increase in manufacturing interests since 1890, these are still insignificant. During that period, the population increased 544.2 per cent., and the average number of industrial wage-earners from 147 to 2,054. In 1900, the amount of actual capital, exclusive of capital stock, invested in 870 manufacturing establishments reporting, was \$3,352,064, and the gross value of products, inclusive of materials re-used in the process of manufacture, \$7,083,938, an increase of 3,825.8 per cent. since 1890. Flour and grist milling is the most important industry, the product in 1900 being valued at \$3,745,434. The rapid development of the cotton crop of the Territory has been attended by a like growth in the manufacture of cottonseed oil. The product in 1900 was valued at \$422,699. Numerous other smaller "neighborhood" industries exist.

Legislation.—Among the acts of the territorial legislature in 1901 were the following: A board of agriculture was created, to consist of 13 members including the governor *ex-officio*, which should collect and publish statistical information concerning agriculture, horticulture, animal husbandry, and kindred industries of Oklahoma, and should have supervision of the county farmers' institute system. The city councils of all cities of not less than 5,000 inhabitants were given authority to establish free public libraries and reading rooms and to levy an annual tax for this purpose not to exceed one mill on the dollar on all taxable property. Authority was given for the establishment of high schools in all counties having 6,000 inhabitants or more, and by another act a university preparatory school was created. Additional buildings were also granted to the University of Oklahoma and to the Agricultural and Mechanical College. The appropriation for the latter was vetoed by the governor; but a writ was granted by the chief justice directing the territorial treasury to pay the amounts certified in the act. Under a decision of the Supreme Court of the United States affirming that trade in cigarettes comes within the scope of the police powers of each State, Oklahoma passed a law prohibiting the selling or giving away or bringing into the Territory for that purpose of any cigarettes, cigarette paper, or substitutes therefor, and making the violation of this statute punishable by a fine of not less than \$10 or more than \$500. The punishment for kidnapping was made imprisonment for not less than ten years.

Statehood.—Agitation continued in Oklahoma during 1901 for the admission of that Territory as a State, either with or without coincident admission for Indian Territory. Both the Republican and the Democratic party in 1900 recommended that Oklahoma, among other Territories, be admitted to Statehood, while prior to that time, several bills to that end had been introduced in Congress. It appears, therefore, that Oklahoma is not unreasonable in demanding that the pledges made before election be fulfilled. But in addition to this, Oklahoma lays stress upon the fact that her population is several times greater than that of any Territory ever admitted to

Statehood, and greater than that of 13 of the present States of the Union; that the Territory has a taxable valuation greater than that of any State of the Union at the time of its admission; a school population almost double the average total population of all other States when they were granted self-government; that 96 per cent. of its population are American born, and that its wealth has been steadily and rapidly increasing. As summed up in a petition sent by the legislature to Congress, Oklahoma has nearly half a million people inhabiting 40,000 square miles, and owning property to the value of \$150,000,000, produced in a single decade; they support more than 2,000 common schools and six large institutions of learning. Attention is further called in this connection to the advantages of uniting Oklahoma and Indian Territory as a single State. There are at present 350,000 white and black American citizens in Indian Territory "without any political privileges, without local self-government, mere tenants at will and peasants of the soil to 70,000 persons of Indian extraction." "They can build neither roads nor bridges, neither schools nor higher institutions of learning, neither asylums for the unfortunate nor refuges for the poor. They cannot protect their cities against fire, nor themselves against epidemic or contagion. "If," the petition continues in its address to Congress, "in your wisdom Oklahoma alone is not entitled to Statehood, we urge the immediate admission into the Federal Union of both such Territories as on single State. We are not unmindful of the treaty obligations of the United States to the Five Civilized Tribes and would not seek their violation." "But the various boards and agencies of the Federal government can proceed after the political privileges of citizenship and the inestimable right of local self-government are secured to the American citizens resident there, quite as well as if the present conditions of tenantry and political obligation shall continue indefinitely."

Governors of Oklahoma.—Cassius M. Barnes, who had been governor of Oklahoma for three years, was retired on May 14, 1901, and William M. Jenkins, formerly secretary of the Territory, was appointed governor by the President. On November 30, 1901, however, Mr. Jenkins was retired by order of the President on charges that he had among other things received a gift of \$10,000 in stock as a result of a contract that had been granted by the Territory to the Oklahoma Sanitarium Company, and that, moreover, this stock had been employed by the governor for political purposes. Upon Mr. Jenkins's retirement, Thompson B. Ferguson was appointed governor of the Territory on December 9.

Kiowa Opening and Land Conditions.—The year 1901 was equalled only by the year 1894 in the amount of land entered upon in the Territory. This was due (1) to the opening up of much of the land formerly in the possession of the Kiowa, Comanche, Apache, and Wichita tribes of Indians in the southern portion of the Territory, and (2) to the free homes law passed by Congress, allowing free entry to be made upon unoccupied portions of the government domain. The Indian land opened to settlement, amounting to about 3,000,000 acres, was bought outright by the government from the Indians for \$2,000,000, of which amount one-fourth was distributed *pro rata* among the 3,000 Indians concerned, while the remainder was held for them as a trust fund. In addition, each Indian was allowed to select a quarter section of 160 acres of land and a tract of 480,000 acres was set aside for the Indians as pasture land. School and mineral lands were further set apart, a forest reserve was established, and four town sites were reserved from the drawing.

Special interest attached to the lands opened up for settlement because of the novel method prescribed by the President for the distribution of the land between the claimants. For a period of 16 days, from July 10 to July 26, 1901, all persons desiring to obtain homesteads were allowed to register at booths established at El Reno and Fort Sill. The envelopes containing the registers were then drawn by lot (August 6) and the order in which the envelopes were drawn marked the order in which persons were allowed to file on the lands. The object of this method was to avoid the bitter contests and hardships incident to the acquisition of claims, which had formerly accompanied the rush for lots upon the Territory. In this object the method was altogether successful, and the distribution of land was admitted to have been made with perfect fairness and without favor or advantage to any one. During the days allowed for registration, 167,000 people were registered, of whom 13,000 drew numbers entitling them to claims.

While much more was said of the land acquired by applicants in the former Indian reservations than of the government land acquired under the free homes act of Congress, yet a very great amount of the latter was acquired during the year. This land, situated in the west of the Territory, is on the whole much less valuable than the Indian reservations, being largely arid. Up to June 30, 1901, however, 1,197,000 acres of government land had been entered upon, and much more was taken before the end of the year, by disappointed applicants for the Indian lands. The government still retains some 4,000,000 acres of land in the Territory subject to free homes entry; but most of it is located in country too high or too rugged to be suited for general agricultural purposes, though parts of it can be utilized for stock raising

Of the newly opened lands in the Indian Territory, part was attached to the adjoining counties of Canadian, Wichita, and Roger Mills, and the remainder was divided into the three newly created counties of Caddo, Comanche, and Kiowa.

Territorial Officers.—Appointed by the President—Governor, Thompson B. Ferguson, Republican; secretary, William Grimes; treasurer, Cassius Rambo; auditor, L. W. Baxter; chief justice, John H. Burford.

OLD-AGE PENSIONS. See PENSIONS FOR WORKINGMEN, QUEENSLAND, NEW SOUTH WALES, NEW ZEALAND, VICTORIA, and BELGIUM.

OLEOMARGARINE. *The Grout Oleomargarine Bill.*—An important bill introduced in the 56th Congress and widely discussed in 1901 in the western and southwestern States was the so-called Grout Oleomargarine Bill, which proposed to make so much more onerous the existing regulations governing the sale of oleomargarine as greatly to diminish the importance of the industry, if not in fact to destroy it entirely. The bill proposed, first, to increase the tax on oleomargarine colored to resemble butter from 2 cents to 10 cents a pound; second, to reduce the tax on uncolored oleomargarine to the merely nominal sum of one-quarter of a cent a pound; and, third, to place the oleomargarine industry under the police laws of the several States in precisely the same manner that the sale of liquor is left to the police laws of the several States. In explaining the necessity for the passage of this bill, the Republican majority of the congressional committee having it in charge stated that the legislatures of thirty-two States, representing four-fifths of the population of the country, had expressed their approval of the proposed legislation through petitions to Congress or otherwise. Under the law as it stands, the committee stated, fraud in palming off oleomargarine for butter cannot be prevented. Some of the largest manufacturers guarantee their retailers protection in case of prosecution, and can afford to do so on account of the enormous profits made from the sales. And for this reason the measure taxing colored oleomargarine is unanimously desired by the farmers of the country, and has received also the explicit approval of the secretary of agriculture. The purpose of the bill is not to ruin the oleomargarine industry, as has been alleged, but to prevent the sale of imitation butter for genuine; to which fraud the committee naïvely adds, the whole growth of the oleomargarine industry is due. To this presentation of the case, the Democratic minority of the congressional committee answered as follows: That all chemists agree that oleomargarine is a nutritious and healthful food equal if not superior to genuine butter; that the only just complaint against the existing oleomargarine law consists in the fact that the retail dealers are enabled under it to sell small pieces of oleomargarine from the original stamped package bought from the manufacturers and to palm off these small pieces as genuine butter; that the proposed Grout Bill merely increases the taxation on oleomargarine without providing any new or additional penalties for the violation of the law, or devising any new means to prevent the sale of oleomargarine as butter. In fact, the minority stated, the advocates of the bill have declared in their testimony before the committee that their sole intention is to absolutely crush out the manufacture of oleomargarine and to eliminate it as a food product. In other words, Congress is being asked to ruin one industry to benefit another, and to set a precedent of the most pronounced kind by which monopolies may be created and competition in almost any line of products destroyed. Not only would the killing of the oleomargarine industry seriously affect cattle and hog raisers and representatives of the cottonseed industry; but there is the less excuse for this since the oleomargarine industry does not at all interfere with the growth and prosperity of the butter industry, statistics showing a much greater per cent. of increase in the production of butter than in the increase of the production of oleomargarine. There is now manufactured in the United States nearly two billion pounds of butter annually, and it is positively known that in 1900 only eighty-three million pounds of oleomargarine were manufactured, representing about 4 per cent. of the amount of butter produced. If a tax of 10 cents a pound were placed upon colored oleomargarine the industry would be destroyed for the sufficient reason that, owing to the pride of the poorer people of the country, who alone buy oleomargarine in quantity, there would be no demand for that article in the uncolored state. At present the colored oleomargarine is retailed at from 12½ to 20 cents per pound, or on an average of perhaps 15 cents per pound. If then the proposed bill were passed, lifting the price of colored oleomargarine to the average price of butter, the laboring classes would be forced to pay on an average of 10 cents more per pound for an article not a whit superior. Moreover, if the argument is advanced that the only purpose of the bill is to prevent fraud, then a clause should be added to the Grout Bill prohibiting the coloring of genuine butter; it being well known that large quantities of a poor quality of butter are "renovated" or "resurrected" and colored to simulate fresh butter. In lieu of the Grout Bill, the Democratic minority of the committee proposed that oleomargarine should be put up in small packages of one pound and less; and that the retail dealer should be compelled to sell the original packages and be forbidden to sell as at present from the original packages; and that each small package

be plainly stamped with the word "Oleomargarine;" and that additional penalties be imposed for the violation of the law by dealers. The Groat Bill was left pending when congress adjourned on March 4, 1901; but there was abundant assurance that it would be again brought forward at the first session of the 57th Congress. See UNITED STATES (paragraph Tariff on Domestic Industries).

OMAN. See ARABIA.

ONTARIO, a province of the Dominion of Canada, with an area of 222,000 square miles and a population, according to the census of 1901, of 2,182,947, as against 2,114,321 in 1891, showing an increase of over 3.2 per cent. Capital, Toronto, with a population of 207,971 in 1901, as compared with 181,220 in 1891. At the end of 1899 there were 6,006 public schools with an enrollment of 471,023; 352 Roman Catholic separate schools, with 41,796 pupils; 130 high schools, with 22,460 pupils; 119 kindergartens, with 11,262; and 76 teachers' institutes. Of higher educational institutions, the province has 6 universities and 6 colleges with a total of over 4,000 students.

Government and Finance.—The administration of the province is in the hands of a lieutenant-governor appointed by the governor-general and assisted by a responsible ministry. There is one legislative assembly, consisting of 94 members elected for four years by universal suffrage. Ontario has 24 seats in the Dominion Senate and 92 in the House of Commons. The revenue and expenditure for the calendar year 1900 were \$4,192,940 and \$4,003,729 respectively. The largest items of revenue were the Dominion subsidy, \$1,196,873; crown lands, \$1,430,166; and licenses, \$354,045. The chief items of expenditures were the maintenance of public institutions, \$828,201; education, \$758,466; administration of justice, \$427,855; and civil government, \$265,347. The provincial debt at the end of 1900 amounted to \$3,135,070.

Industries and Commerce.—In 1900 the province had over 13,000,000 acres of cleared land, of which nearly 9,000,000 acres were under crops. The chief crops for the same year were as follows: Fall wheat, 23,369,737 bushels (14,439,827 in 1899 and 25,158,713 in 1898); spring wheat, 6,940,333 bushels (7,041,317 in 1899); oats, 89,693,327 bushels (89,897,724 in 1899); and barley, 16,909,751 bushels (14,830,891 in 1899). The 323 creameries of the province yielded in 1899, 9,113,964 pounds of butter, valued at \$1,746,362. The mineral production has been comparatively unimportant. At the end of 1900, however, a foundry of the Canada Iron Company, with a daily capacity of 150 tons of pig iron, was opened at Midland. The product of the fisheries for 1899 was valued at \$1,590,447, as against \$1,433,632 in 1898.

The increase in the commerce of the province for 1899 was maintained during 1900 in the case of imports and exceeded in the exports. The former were valued at \$71,258,544, as against \$60,308,057 in the preceding year. Of that amount \$46,184,674 represented the produce of the United States, which in 1899 amounted to \$40,143,817. The exports, foreign and domestic, increased from \$48,137,912 in 1899 to \$56,116,756 in 1900, an increase of nearly \$6,000,000, against less than \$1,500,000 for 1899. The merchant marine of the province at the end of the calendar year 1900 numbered 1,064 steamers (952 in 1899) and 546 sailing vessels, with an aggregate net tonnage of 141,112.

Communications.—The province of Ontario has over one-third of the total railway mileage of the Dominion. In 1900 the total length of the provincial lines was 6,812 miles, while that of the entire Dominion was 17,824 miles. The total amount paid out in subsidies by the provincial government and the municipalities up to June 30, 1900, was \$19,795,171. The government telegraph lines of the province had a length of 35 miles at the end of 1900.

History.—The provincial legislature in 1901 passed a bill, introduced by the premier, appropriating \$1,000,000 for improved highways, and also a bill for the encouragement of the beet-sugar industry. The legislature appropriated the sum of \$10,000 for the survey of a railway route to Lake Timiskaming. For a line to start at Port Arthur and to extend eventually to Lake Joseph, on the Albany River, a bonus was granted of \$2,000 a mile for the first thirty miles, with 5,000 acres of land a mile in addition. The report of the commissioner of crown lands on the results of the exploration of "New Ontario," the northern portions of the province, revealed unexpected agricultural and forest resources, which should lead to the development of that hitherto little-known district. The Dominion government supplemented the efforts of the province to develop "New Ontario" by a contract for the annual purchase in the province of 25,000 tons of steel rails for five years. Another important project was a bill for the subsidizing of the Manitoulin and Shore Railway and the consequent development of eastern Algoma. Consequent upon the threatened exhaustion of the natural gas in Essex County, vigorous legislation was advocated to prohibit the export of the gas across the Detroit River into the United States.

ORANGE RIVER COLONY, formerly the Orange Free State, which was annexed to the British empire on May 28, 1900, lies to the south of the Transvaal and north and northeast of Cape Colony. Its area is estimated at 48,326 square miles.

At the beginning of the Boer War it had a population of 207,503, comprising 77,706 whites and 129,787 Kaffirs. Eighty-five per cent. of the white population was Dutch. Towards the end of 1901 it was estimated that of the white inhabitants in the country in 1899, more than 10,000 were prisoners in the hands of the British, about 17,000 were living in the towns under British protection, 35,000 were gathered in the concentration and refugee camps, and from 13,000 to 15,000 were in the field against Great Britain, or dead. The capital and largest town is Bloemfontein, which had before the war a population of 5,000. In January, 1901, there were 26 schools in the colony, with 66 teachers and 1,200 pupils. The country is not well adapted to agriculture, and out of 29,900,000 acres, less than one per cent. was cultivated before the war. Grazing and sheep-farming were the chief occupations. Diamonds and coal are the principal minerals found, the output of the former in 1898 being valued at \$7,543,000. Gold and garnets are also found. The leading exports are diamonds, wool, hides, grain, and ostrich feathers. Trade is almost exclusively with Cape Colony, the Transvaal, and Basutoland. In 1898, the last year for which statistics are available, the exports to British South Africa were valued at £1,923,425, and the imports at £1,190,932. On January 1, 1899, there were 392 miles of railway owned by the government and 1,900 miles of telegraph. In 1898 the total revenue was £799,758, and the expenditure £956,752, and the public debt amounted to £1,380,000. During the British occupation up to June 30, 1901, the revenue amounted to £402,925 and the expenditure £386,038. For an account of the Anglo-Boer War in 1901, including operations in the Orange River Colony, see TRANSVAAL.

ORE DEPOSITS. Interest in the origin of ore deposits still continues, and the paper on *Some Principles Controlling the Deposition of Ores*, read by Van Hise, in February, 1900, has perhaps been the cause of the appearance of several articles discussing the origin of ores. J. F. Kemp, in a paper on *The Role of the Igneous Rocks in the Formation of Veins*, disputes many of the theories brought forth by Van Hise. He believes that most mineral veins are connected with igneous rocks, and asserts that the action of underground water does not extend to great depths. L. De Launay contributes an interesting paper on the *Secondary Enrichment of Ore Deposits* (Amer. Inst. Min. Eng., Richmond meeting, 1900), in which he agrees with many of the remarks made by W. H. Weed in a previous paper on the enrichment of ore deposits by later metallic sulphide (*Trans.*, Amer. Inst. Mining Engineers, February, 1900). Mr. Weed, in a paper on the *Influence of Country Rock on Mineral Veins*, considers (1) that the structural characters of vein fissures vary with the nature of the country rock; (2) that the mineral conditions of veins formed wholly by the filling of open fissures are not affected by the nature of the vein walls; (3) the mineral contents of ore deposits formed by metasomatic replacement vary with the nature of the inclosing rock; and (4) as metasomatic processes vary in character with the nature of the solutions, no invariable general relation can be established between certain rock types and rich ore deposits (*Trans.*, Inst. Min. Eng., Mexican meeting, November, 1901). H. C. Biddle (*Jour. of Geol.*, ix, p. 430), in a paper on the *Deposition of Copper by Solutions of Ferrous Salts*, shows from experiments that it is possible to produce metallic copper by the action of ferrous salts on copper salts in solution. The results have an important bearing on the method of origin of the native copper ores of the Michigan region. Among other papers published during 1901 should be mentioned: J. H. L. Vogt, *Problems in the Geology of Ore Deposits* (*Trans.*, Amer. Inst. Min. Eng., Richmond meeting, February, 1901); J. F. Kemp, *The Deposits of Copper Ores at Ducktown, Tenn.* (*Ibid.*); W. J. Malcolmson, *The Sierra Mojada (Coahuila, Mexico), and its Ore Deposits* (*Trans.*, Amer. Inst. Min. Eng., November meeting, 1901). Another important work is R. Beck's *Lehrbuch der Erzlagertstätten* (Freiburg, 1901).

OREGON, a Pacific coast State of the United States, has an area of 96,030 square miles. The capital is Salem. Oregon was organized as a Territory, August 14, 1848, and admitted as a State, February 14, 1859. The population in 1900 was 413,536, while in June, 1901, as estimated by the government actuary, it was 424,000. Portland is the largest city, with a population of 90,426 in 1900.

Finances.—The balance in the State treasury on January 1, 1901, was \$944,623.40. Receipts for the following calendar year were \$1,761,833.28; the expenditures were \$1,878,159.43, leaving in the treasury \$828,297.25. The State has no bonded debt. The State tax rate for the year was 5.7 mills. The total value of property in the State as returned for taxation was \$117,804,874.13.

Industries.—From preliminary reports of the census of 1900 it appears that the industries of Oregon remained practically stationary during the last decade. In 1890 there was invested in the 1,523 manufacturing and mechanical establishments reporting, a capital exclusive of capital stock of \$32,122,051. At that time the population was 313,767. Although by 1900 the population had increased to 413,536, the amount of capital invested in industries had increased by a very small amount, being \$33,422,393. It is to be noted, nevertheless, that the number of manufacturing establishments had largely increased, being 3,088, as against 1,523 in 1890. The

active capital invested in 1900 was distributed as follows: In land, \$4,597,502; in buildings, \$5,684,991; in machinery, tools, and implements, \$10,492,960; and in cash and sundries, \$12,646,940. At the same time the number of salaried officials and clerks was 1,280, and their salaries amounted annually to \$1,323,155. The total number of wage-earners was 17,236, and their wages amounted to \$8,333,433. Of the wage-earners 15,120 were men, drawing wages of \$7,830,594, 1,821 were women, drawing wages of \$452,939, and 295 were children under 16, drawing wages of \$49,900. The gross value of industrial and manufacturing products in 1900 was \$46,000,587, as against \$41,432,174 in 1890. The cost of materials used in manufactures in 1900 amounted to \$26,099,855, and miscellaneous expenses aggregated \$2,242,795. In 1890 Oregon was the thirty-eighth State of the Union in population, and thirtieth in the value of its manufacturing industries. In 1900 it was the thirty-fifth State in population and the thirty-sixth in the value of its industries.

Legislation.—One of the most important acts of the legislature in 1901 was that providing for the submission to the people at the general election in June, 1902, of an amendment to the constitution proposed by the legislature of 1899. This amendment provides for the initiative and referendum. The terms of the initiative are that on petition of 8 per cent. of the voters any law proposed in the petition, or any proposed amendment to the constitution, must be submitted to the people for adoption or rejection; similarly on petition of 5 per cent. of the voters, any bill enacted by the legislature must be submitted to the people for ratification or rejection. Another election law contains an exhaustive description of what is commonly known as "coercion, intimidation, or persuasion of voters" by companies and corporations; this offense is prohibited under penalty of a fine not to exceed \$1,000 and the forfeiture of the corporation's charter. Some of the more important labor laws passed by the legislature are as follows: Street railway companies are required to provide vestibules on their cars for the protection of their employees from the first of November in each year to the first of April. It is made a misdemeanor for any person to carry on the business of barbering on Sunday. All persons charged with buying supplies of any kind for the use of any institutions of the State or of any political subdivision thereof are required to prefer those grown, manufactured, or produced in Oregon. Congress was petitioned not only to reenact the Chinese exclusion law of 1882, but to extend the law so that it would apply indefinitely and would be made applicable to the Japanese and other Mongolian and Asiatic races. A petition to Congress vigorously recommending the passage of the Grout Oleomargarine Bill (see OLEOMARGARINE) was in part as follows: "Whereas the dairy interests of Oregon are growing rapidly, and because of the great natural advantages in the production of grasses and forage plants in all parts of Oregon, and because of the growing markets throughout Alaska, the islands of the Pacific, and our great northwest, this industry, if properly protected and fostered, will become one of our greatest and most reliable sources of wealth; and, whereas this production is now hindered by the production of imitation butter, . . . we urge the passage of what is known as the Grout Bill." Another petition to Congress sets forth that the Columbia River, with the exception of the distance between the Dalles and Celilo Falls, in Oregon, is navigable to Kettle Falls in Washington, a distance of over 700 miles; that owing to the topography of the country, the producers of the vast region known as the Columbian Basin can reach the markets of the world only through the Columbia River; that a canal and locks making the Columbia wholly navigable to Kettle Falls could probably be constructed for \$4,000,000, and Congress is cordially invited to construct such canal and locks around the falls. An act practically providing for the election of senators by a popular vote of the people provides that at all general elections preceding the election of a senator to Congress by the legislature, there shall be placed upon the official ballot all candidates for the office of senator; and such candidates shall be nominated in the same manner as are candidates for State positions. It shall then be the duty of the legislature when that body meets to "announce the candidate for senator having the highest number, and thereupon the House shall proceed to the election of a senator as required by the act of Congress and the constitution of the State." In other words, the legislature in effect binds itself to elect as senator that man who has received the highest number of votes for the office at the preceding general election. An act to make the education of deaf mutes compulsory, provides that all deaf-mute children, unless taught at home or in a private school, shall be required for at least six months each year between the ages of 8 and 16, to attend the deaf-mute school established by the State. Amendments proposed to the constitution by the legislature were as follows: That municipal corporations be no longer formed by special laws, but in conformity with general laws and schemes passed by the legislature, which body shall provide for the incorporation, organization, and classification of cities and towns according to their population; that general State elections shall be held biennially in November, instead of as at present, biennially in June; that the following provision of the constitution be abrogated: "no free negro or

mulatto not residing in this State at the time of the adoption of this constitution (1857) shall come, reside, or be within this State, or hold any real estate or make any contracts or maintain any seat therein; and the legislative assembly shall provide by penal laws for the removal by public officers of all such negroes and mulattoes, and for their effectual exclusion from the State and for the punishment of persons who shall bring them into the State or employ or harbor them." The legal effect of this amendment was rendered void by the Fourteenth Amendment to the United States constitution; nevertheless, the former proposal that it be formally abrogated was defeated at the polls in November, 1900.

Elections.—On February 24, 1901, the legislature elected John H. Mitchell, Republican, as United States senator, for the full term ending March 4, 1907, to succeed George W. McBride, Republican. From the day on which the legislature met on January 15, to the day of its final adjournment on February 24, the two principal candidates were George W. McBride and Henry W. Corbett. On neither of these two candidates, however, could the Republican caucus agree, and on the last day of the session after 48 ballots had been taken, Mr. Mitchell's name was presented to the legislature and he received 35 out of the 71 Republican votes. On the final, and 53d ballot, 11 Democrats joined with the Republicans to elect Mr. Mitchell over Mr. Corbett.

State Officers.—Elected for four years ending January, 1903: Governor, T. T. Geer, Republican; secretary of state, Frank I. Dunbar; treasurer, C. S. Moore; attorney-general, R. D. N. Blackburn; superintendent of public instruction, J. H. Ackerman. Supreme Court: Chief justice, Robert S. Bean, term expires July, 1902; associate justices, Charles E. Wolverton and Frank A. Moore—all Republicans.

Congressional Representatives (57th Congress).—In the House—Thomas H. Tongue, from Hillsboro, and Malcolm A. Moody, from The Dalles—both Republicans. In the Senate—Joseph Simon (until 1903), from Portland, and John H. Mitchell (until 1907), from Portland—both Republicans.

ORLEANS, HENRI PHILIPPE MARIE, Prince d', traveler, died at Saigon, French Cochinchina, August 9, 1901. He was born at Havre, France, October 16, 1867, and began the explorations for which he was most widely known by a journey to India in 1887. After visiting Bombay, Agra, Delhi, Lahore, Calcutta, Madras, and Afghanistan and Ceylon, he went to Japan, and in 1889 accompanied M. Bonvalot on an expedition into Siberia, Tonquin and Thibet, winning the gold medal of the Royal Geographical Society for the information he gathered. He traveled extensively in other countries of Asia and in Africa, and published descriptions of his journeys, in one of which he made disparaging statements concerning the Italian military operations in Abyssinia, for which he was challenged by the Prince of Turin in 1897, and seriously wounded. Besides many newspaper and magazine articles, Prince Henri published *Une Excursion en Indo-Chine* (1892); *Autour du Tonkin* (1893); *A Madagascar* (1895); and *Six Mois aux Indes, Chasses au Tigre* (1899).

ORMEROD, MISS ELEANOR A., entomologist, died July 19, 1901, at Sedbury, Gloucestershire, England. She was born in 1828 and was the first to publish a descriptive work dealing with the English insects injurious to crops that was available for general distribution. This volume was the first part of *Notes of Observations of Injurious Insects*, published in 1877 by Miss Ormerod with the cooperation of T. A. Presten and E. A. Fitch. She prepared a series of annual reports dealing with entomology, and was the author of *A Manual of Injurious Insects with Methods of Prevention and Remedy for their Attacks of Food Crops, Forest Trees, and Fruit, and with Short Introduction to Entomology* (1881); *Guide to Methods of Insect Life and Prevention and Remedy of Insect Ravage*, which was republished in 1892 as *A Text-Book of Agricultural Entomology; Notes and Description of a Few Injurious Farm and Fruit Insects of South Africa* (1889); and *A Handbook of Insects Injurious to Orchard and Bush Fruits, with Means of Prevention and Remedy* (1898). Miss Ormerod, who was a fellow of the Entomological Society of London, was at one time consulting entomologist to the Royal Agricultural Society and was an examiner in agricultural entomology to the University of Edinburgh, from which she received the honorary degree of D.C.L.

ORNITHOLOGY. Aside from the gatherings of ornithologists and the great amount of literature published relating to birds, the only respect in which the year 1901 is of especial interest is in the matter of bird protection. The destruction of birds has assumed such proportions in all civilized countries that it is no longer a matter of sentiment, but a question of real economic importance. Reports come from Europe, America, Africa, and India of movements for the better protection of birds, while in Australia during the past year there was strong agitation of the subject. It is said that not only is man directly slaughtering the native birds (one man alone being reported to have killed 250 lyre-birds in a single season), but indirectly, by the extension of cities and the consequent destruction of timber and

undergrowth, and by the introduction of foreign mammals (cats, foxes, etc., to prey on rabbits) and birds (starlings and sparrows), he is making their struggle for existence very severe. Among the remedies suggested is that of teaching in the public schools the duty of bird protection. An awful indictment of human destructiveness has been prepared by a writer in *Nature*, who names no less than twenty birds known to have been exterminated by man, all but five during the nineteenth century. Of these, the great auk, Pallas's cormorant, and Labrador duck were distinctly North American birds, while a fourth, the burrowing petrel, was West Indian. In this connection, it is interesting to record that during 1901 Professor Verrill, of Yale, attempted to obtain in the Bermudas some remains of the remarkable "cahow," an oceanic bird, abundant during the breeding season on the Bermudas in the seventeenth century. Although he failed to find any remains, he obtained many facts in regard to the bird which lead him to believe that it was probably a species of auk. In the United States the year 1901 was one of unusual activity among bird protectors, led, as in previous years, by the committee on bird protection of the Ornithologists' Union. The most notable part of this work has been effected through aid of the Thayer Fund collected by Mr. Abbott H. Thayer, and expended primarily for the protection of gulls and terns, by the employment of wardens to guard the birds during the breeding season. Incidentally, also, members of the committee have appeared before legislative committees and urged (generally with notable success) the passage of improved bird-protecting laws. During the past year the committee expended over \$1,800 in this work, chiefly along the Atlantic seaboard and along the Gulf coast. The greatest expenditure incurred was in Maine, with Louisiana second, and Virginia third. Altogether twenty-seven wardens were employed, and six legislatures visited. Another efficient agent in the protection of birds has been the vigorous and impartial enforcement of the Lacey Act of 1900, by Dr. T. S. Palmer, of the Department of Agriculture. This has gone far toward suppressing the trade in sea-birds for millinery purposes, and has caused consternation among illicit game dealers. It is safe to say that there has never been a time when wild birds were as efficiently and wisely protected in the United States as they are to-day.

Organisations.—The various societies devoted to the study of birds seem to have had a successful year, and are steadily growing in number, size, and importance. The latest national organization is the "Australasian Ornithologists' Union," patterned after the union of Great Britain and America. The first meeting was held at Adelaide in November, 1901, and an organization was effected. Prompt and aggressive action for the protection of native birds was determined upon, and it was also decided to publish a magazine to be called *The Emu*. A general meeting is to be held annually in the capital of some one of the states. The organization of English-speaking ornithologists thus lacks only a South African union to be regarded as fairly complete. Nothing of especial interest seems to have marked the year for either the British Ornithologists' Union or the Deutsche Ornithologisches Gesellschaft. The American union had another successful year, and at the meeting held in New York in November the proposed changes regarding classes of members were made. There are now nearly 750 members, distributed as fellows (limited to 50), members (limited to 75), honorary fellows, corresponding fellows, patrons, and associates. At the New York meeting, 83 new associates, 5 new fellows, and 55 members were elected. The finances of the union were reported to be in excellent condition. The public sessions were well attended, and many of the papers called forth much interest. Twenty papers were presented, five of which were illustrated with lantern slides. The meeting of the union in 1902 will be held in Washington. There is no space to refer in detail to the Audubon Society (the annual meeting of which was held in New York at the same time as the meeting of the A. O. U.), the Cooper Ornithological Club, the Delaware Valley Ornithological Club, nor the Bird Club of Princeton University, each of which has had a prosperous year. Nor can the several State ornithologists' unions, found in Maine, Nebraska, and elsewhere east and west, be more than referred to. Of most of these the annual meetings were well attended and much interest was shown.

Literature.—All of the periodicals devoted to ornithology apparently enjoyed a very successful year. The principal newcomer on the field was the *Emu*, already referred to, the first number of which was dated October, 1901. It is a small pamphlet of thirty-two pages, containing a variety of short papers and notes on Australasian birds. The *Emu* has a free field of remarkable interest, and will undoubtedly become as invaluable a journal as the *Ibis* and the *Auk*. The latter journals during 1901 maintained their prestige as leaders in the ornithological world; taken together they furnish a complete account of all important events occurring in that field. The other American journals, *Bird-Lore*, the *Condor*, and the *Osprey*, all contributed a great deal of interesting literature, particularly in the more popular branches of the science. Of more technical papers many appeared in various scientific journals. Among these may be mentioned an attempt to simplify the

classification of birds, and place it on a basis comparable with the classification of other animals. The paper appeared in the *Auk*, October, 1901, and the proposed new arrangement is based upon the fundamental plan of the pterylosis. The value of such a scheme will depend of course upon whether the plan of pterylosis is really one of the most deep-seated and least modifiable of a bird's characters. The relationships of the ostrich-like birds were treated by Mr. W. P. Pycraft in a paper entitled *On the Morphology and Phylogeny of the Palæognathæ and the Neognathæ*. (Trans. Zool. Soc. London), and the author reaches some very positive conclusions, which will doubtless cause discussion, as they are not in accord with previous views on the subject. In various publications, Dr. R. W. Shufeldt continued his very valuable contributions to our knowledge of the osteology of birds, treating of the woodpeckers, owls, sand-grouse, screamers, etc.

Of the numerous books that have appeared, we must mention *How to Know the Indian Ducks*, by F. Finn, a small volume of over 100 pages, thoroughly scientific and reliable, and of especial value to sportsmen in India; the second volume of Stark's *Birds of South Africa*, prepared for the press by W. L. Sclater, containing accounts of 199 species of Passerine birds and illustrated by 83 wood-cuts; the third volume of Sharpe's *Hand List of the Genera and Species of Birds*, including about 400 genera and 3,000 species, more than a third of which are included in the families of American and old-world flycatchers; *Bird Watching*, by Edmund Selous, a volume of over 300 pages devoted to the habits of birds; Harting's *Handbook of British Birds*, a useful volume of over 500 pages, illustrated by 35 colored plates; *A Manual of the Birds of Iceland*, by H. H. Slater, a valuable contribution to ornithological literature, dealing with 108 species, only a dozen of which are land birds; and a volume by the artist J. G. Millais on *The Wildfowler in Scotland*, of special interest to sportsmen, but full of observations on the habits of ducks, which are of real value to ornithologists.

Of American books, the leading place undoubtedly belongs to the first volume of Ridgway's *Birds of North and Middle America*, a book of about 750 pages, dealing with 389 species of the finch family. In many respects it is a model of systematic work, but it neglects entirely the habits and life-histories of the birds. It is based on the collections in the National Museum and is published by the government. An attractive book illustrating bird photography is Herrick's *The Home Life of Wild Birds*. It contains 14 chapters full of interesting facts relating to the home life of some of our common land birds, illustrated by 141 original photographs from nature. Mrs. Fannie H. Eckstorm is the author of two popular books worthy of mention, called *The Bird Book* and *The Woodpeckers*. They are designed for the use of school children, are accurate, well written, and fully illustrated, and accordingly are admirably adapted to their purpose.

ORZESZKO, ELIZA, a Polish novelist, whose latest book was translated into English in 1901 under the title of *The Argonauts*, was born at Milkowszczyzna in 1842. Educated at Warsaw, she married in 1858 Peter von Orzeszko, who was exiled to Siberia by the Russian government for participation in the revolution of 1863. Her first published work, a prose idyl, appeared in the *Tygodnik Ilustrowany* in 1866, under the title *Obrazek z lat glodowych* (*A Sketch of the Lean Years*). She has been the most prolific of Polish writers, her collected works, published in 1884-88, numbering forty volumes. In her novels she deals with the status of woman in Poland, with the persecution of the Jews, with whom she lived for a long time, and with the social and economic conditions of the small landholders. A strong sympathy permeates her work, and she has constituted herself the especial champion of woman's rights. She has also written numerous essays on literary and social matters, including one on *Patriotism and Cosmopolitanism* (1880). Among the best known of her stories are: *W Klatce* (*In Prison*) (1867); *Nadine sumienia* (*At the Bottom of Conscience*) (1871); *Am Niernen* (1888-89); and *Bene Nati* (1890).

OSTEOPATHY. To avoid prosecution for practicing the healing art without license, the osteopaths sought to secure legislation in several States in 1901. In May, a county judge in Pennsylvania decided that the practice of medicine means the treatment of disease by the use merely of drugs, and that any other kind of treatment is not such practice. Such a decision, uncontradicted, would allow osteopathy to rank with hydrotherapy, psychiatry, obstetrics, ophthalmology, and most surgery, and would rule all the latter branches out of the field of medical science. On the other hand, a justice in Birmingham, Ala., ruled that osteopathy is the practice of medicine, and that any person engaging in it must obtain a license to practice medicine. He defined medicine as the science which relates to the cure, prevention, or alleviation of disease. In New York City it was decided that an osteopath cannot recover pay from a patient to whom he represents himself as a practitioner of the healing art, in a suit in December, 1901. A bill was introduced in the Wisconsin legislature to legalize and regulate the practice of osteopathy in that State. It does not allow osteopaths to pose as physicians, and will afford no relief to persons charged with practicing medicine without a license. The bill

further states that osteopathy is not medicine or surgery within the meaning of the statutes. In Richmond, Va., in June, 1901, two osteopaths were acquitted of the charge of practicing medicine without a license, the judge having instructed the jury that the defendants did not come within the limits of the statute providing for a permit to practice medicine from the State board of examiners. The case will go to the supreme court on appeal.

PACIFIC CABLE. The Pacific cable, all-British, which is to connect British Columbia with Australia and New Zealand, was contracted for during 1901, and is to be completed and in working order by July 31, 1902. The contract was let to the Telegraph Construction and Maintenance Company, a London corporation, for £1,795,000 (\$8,735,367), and with the cost of installation and surveying the total cost will amount to £1,999,000 (\$9,728,133). Great Britain and Canada are to bear together five-ninths of the expense, and New Zealand, Queensland, New South Wales, and Victoria, the remainder. The cable when completed is to be in charge of a board of commissioners, upon which the several colonies interested will be represented. The board is to be empowered to issue debentures for the payment of capital and interest, which will become a first mortgage on the cable property and its earnings. The British government in July, 1901, announced that it would advance £2,000,000 for the construction of the cable. During the spring of 1901 Canada complained of concessions granted by New South Wales to the Eastern Extension Company for overland business in that state; but in August the bill authorizing Canada's contribution to the cost of construction, which had been held back because of the action of New South Wales, was passed.

The route of the cable will be from Vancouver, B. C., via Fanning (or Palmyra) Island to the Fiji Islands and thence to Norfolk Island, whence branches will be laid to Auckland, New Zealand, and to Queensland. The length of the cable, allowing 10 per cent. for slack, will be 7,986 nautical miles. It is estimated that 1,940,000 words can be transmitted in a year. At a tariff of 2s. (49 cents) a word, it has been estimated that the annual revenue will amount to £109,807 (\$534,376), and that by the fourth year the cable will become a paying concern.

PAINTING. United States.—During 1901 the works of American artists were brought into unusual prominence and significance by the Fine Arts exhibit of the Pan-American Exposition at Buffalo, one of the most important events in the history of United States art. Art works of the United States, Canada, and Latin America, alone were admitted, the art of the Old World being excluded. Even the productions of American artists who have become permanent residents of Europe and relinquished their United States citizenship were not accepted. An idea of the progress made in the New World in painting, sculpture, drawing, etching, engraving, and architecture was thus afforded, unshadowed by Old World glories and traditions. The result was the finest and most extensive exhibition of purely American art productions, retrospective and modern, ever presented to the public. The standard of admission was exceptionally high. Eight hundred pictures were accepted, and out of 227 prizes for paintings, drawings, engravings, and sculpture, 180 were awarded to paintings. This exhibition emphasized the importance of the movement now being strongly supported and pushed by the United Fine Arts Building Committee, to institute a central art home or national gallery and national society, comparable with those of England or of France. As in the case of Paris and Glasgow, Buffalo gains by the exposition in the inheritance as a permanent structure of the Albright gallery, one of the finest art buildings in the country, to be hereafter occupied by the Buffalo Fine Arts Academy.

The Pennsylvania Academy of Fine Arts, the oldest and one of the best institutions of the kind in America—in the world antedated only by the Paris Salon and the Royal Academy of England—held its seventieth annual exhibition at Philadelphia, in January and February. The jury of selection and the exhibition were international; but, with few exceptions, the exhibits were purely American, and another exemplification of what American contemporary artists are doing in painting and sculpture. Nine hundred and sixty subjects were enumerated in the catalogue, and in extent and general excellence, the exhibition surpassed all its predecessors. Among some of the most striking exhibits were Sargent's portrait of General Ian Hamilton, J. J. Shannon's portrait of his wife; "Old Welsh Woman," by J. McLure Hamilton; "Going Home," by Belle Haven; "Pasture Lot," by Henry W. Ranger; "I Will Give You Rest," by Anna Lea Merritt; "Girl with Mirror," by Edmund C. Tarbell; "In the Boudoir," by Fred. Dana Marsh; "Day Lilies" and "Autumn," by Robert Reid; "Baby Arises," by Mary Cassatt; "Christ Among the Doctors," by H. O. Tanner; "Summer Clouds," by Charles H. Davis; "Lamplight," by F. C. Penfold; and "To the Tigers," by F. V. Du Mond. An interesting description of the nineteenth annual exhibition of this academy will be found in Mrs. Trollope's *Domestic Manners of the Americans* (1832), republished during the year.

The seventy-sixth annual exhibition of the National Academy of Design, pend-

ing the rebuilding of their new galleries (see ARCHITECTURE), was held in the galleries of the American Fine Arts Society, 215 West 57th Street, New York, in January and February. The works consisted of originals by living artists in oil, pastel, or sculpture, that had never before been publicly exhibited in Manhattan or Brooklyn. The exhibition was the superior of many preceding years. While rich in portraiture, the exhibition showed great progress in landscape art, and the prize pictures were singled out with good judgment, not necessarily indorsed by all connoisseurs. The Thomas B. Clarke prize of \$300 for the best figure composition painted in the United States by an American citizen, was awarded to William Fair Kline for "The Flight into Egypt." The recipients of the Julius Hallgarten prizes of \$300, \$200, and \$100 for the three best oil color pictures painted in the United States by American citizens under 35 years of age, were (1) W. Elmer Schofield, for "A Winter Evening"; (2) Clara T. McChesney, for "A Good Story"; (3) Matilda Browne, for "Repose." The Norman W. Dodge prize of \$300 for the best picture painted in the United States by a woman, this being the last year of the prize, which was instituted in 1887, was won with a "Portrait Study," by Mary Theresa Hart. The Inness gold medal, presented by George Inness in memory of his father for the best landscape in the exhibition, was awarded to Bruce Crane for "The Year's Wane," the picture being further honored with purchase by Mr. Andrew Carnegie.

At the sixth annual international exhibition at the Carnegie Institute, Pittsburgh, Pa., the number of American pictures was exceeded by that of foreign ones. This comparatively young exhibition now apparently outranks in the interest it excites the time-honored Academy of Fine Arts in Philadelphia. Out of 600 canvases sent in, only 247 were chosen for exhibition; of these 98 were by American, 17 by Franco-American, and 3 by Anglo-American artists. French painters sent 60; English, 30; Scotch, 17; Italian, 7; German, 5; Dutch, 3; Spanish and Norwegian, 2 each; Belgian, 1; and South American, 1. The gold medal prize, with its award of \$1,500, was won by Alfred H. Maurer, with his picture, "An Arrangement"; the second prize was awarded to Miss Ellen W. Ahrens, for "Sewing," and the third prize to E. C. Tarbell, for "The Venetian Blind."

Alfred H. Maurer was also successful in winning the George Inness, Jr., prize at the Salmagundi Club Exhibition, 12th Street, New York, and had three pictures hung on the line at the twenty-third annual exhibition of the Society of American Artists, where, out of 1,300 canvases sent in, 900 were rejected. At this exhibition Ben Foster, with "Mists of the Morning," received the Seward Webb prize of \$300 instituted in 1887 for the best landscape by an American artist under 40. Sergeant Kendell, with his "Fairy Tale," was awarded the Shaw prize of \$300 for the best figure composition in oil by an American citizen, and the Carnegie prize of \$500 for the most meritorious American oil painting in the exhibition was won by John W. Alexander with "Autumn."

The twelfth annual exhibition of the New York Water Color Club, while smaller than formerly, was far more interesting, a wise discretion having eliminated the usual flood of mediocrities.

The annual exhibition at the Chicago Art Institute equaled its predecessors in variety and general excellence, 102 artists being represented. Landscapes dominated the exhibition, the two leading exhibitors of this class being William Wendt and Frank C. Peyraud.

The art exhibition at the Charleston Exposition was almost as large as that of Buffalo, with from 400 to 500 representative works of the leading painters of the country. The only foreign work shown was Chatran's historical painting, "McKinley Signing the Peace Protocol with Spain." Among other notable exhibitions throughout the United States were those of the Boston Art Club, oil paintings and sculpture, and later a water-color exhibition; the exhibition of the Boston Society of Arts and Crafts, of the Boston Society of Water-Color Painters, and of the Boston Art Students' Association—the new gallery. Exhibitions were also held by the New York Society of Landscape Painters, the New York American Society of Miniature Painters, the New York Black and White Club, two by the National Arts Club, New York, one of ecclesiastical art, the Women's Art Club, New York, one at the American Art Galleries, New York City, of over two hundred water-color drawings by representative Japanese artists, and others by the New York Ceramic Society, Brooklyn Art Club, the Brooklyn Society of Mineral Painters, the Society of Washington Artists, the Washington Water-Color Club, the T Square Club, Philadelphia, the Art Club of Philadelphia (water-colors), Cincinnati Art Museum, Richmond Art Association, Rochester Art Club, Louisville Art League, Kansas City (Mo.) Art Club, Cleveland Water-Color Society, Cleveland Art Club, Syracuse Art Club, Erie (Pa.) Art Club, Baltimore Water-Color Club, Minneapolis Society of Fine Arts and the Minneapolis Society of Arts and Crafts, Detroit Art Club, St. Louis Art Club, Denver (Col.) Art Club, and the Providence Art Club (arts and crafts). Evidence of the high standard of art education in American institutions was demonstrated in the exhibitions and in the reports and samples of students'

work in the university and other art schools, school art leagues, galleries, and museums throughout the country. The one-man shows, private and commercial exhibitions, and art sales were as numerous as ever, and form too long a list for invidious particularization.

The acquisition of European old-world art treasures for American public and private collections continued as in the past, among the best acquisitions of the year being four of the finest examples extant of the work of Hubert Robert, the French painter known as "Robert of the Ruins," for the Chicago Art Institute. The pictures are superb works representing ancient Roman ruins. Velasquez's "Prince Balthazar Carlos and his Dwarf" was acquired by the Boston Museum of Fine Arts, and the Metropolitan Museum of New York was presented with the celebrated portrait of Columbus by Sebastian Venetus, *b.* 1485, known as the "Talleyrand" Columbus, through having formerly been the property of the diplomat.

Great consternation was caused among art lovers late in the year by the discovery, through Mr. Sidney Cooper, R.A., that out of 286 pictures submitted to him for verification as his work, 255 of them bore a forged signature. Information from reputable dealers disclosed the fact that forgeries of famous living artists are not generally offered for sale until their death, when the spurious pictures are immediately placed on the market by unscrupulous dealers. That the great majority of these forgeries go to the galleries of rich Americans, is a further disquieting statement.

The United States government imposition of a 20 per cent. duty on all imported works of art, continues to be deplored in Europe as a deterrent in the sale of works of living foreign artists to some of their best customers.

Foreign.—At the Royal Academy, London, out of 14,353 pictures submitted to the council for the 133d Summer Exhibition, only 1,823 works were accepted, the number being smaller than usual, owing to Mr. Constant's "In Memoriam" portrait of Queen Victoria, by royal command, occupying an entire wall. Constant's great picture only attracted ordinary attention. Among the chief features were "Under the Roof of Blue Ionian Weather," by Sir Alma Tadema; pictures by Messrs. Clausen, La Thangue, Napier Henry, Shannon, Orchardson, and Mr. Sargent's strikingly bold portrait, "The Daughters of Mr. Wertheimer." The sales exceeded those of the previous year, over £20,000 (\$100,000) worth of pictures being sold. There was a distinct improvement over several preceding years in the Summer Exhibition of the New Gallery. There were excellent specimens in landscape, genre, and portraiture, and it was interesting to note a revival of *tempera* painting, colors mixed with yolk of egg, the chief advantage of which is permanence of color, media so mixed not darkening with time. Mr. Batten's "Mother and Child," Mr. Joseph Southall's "New Lamps for Old," and two beautiful little pictures by Mrs. Marianne Stokes, finished by this method, showed its brilliancy. Mr. Benjamin Constant's portrait of Mr. Wentworth occupied the place of honor, and was an effective and clever likeness. Mr. Sargent's full-length portrait of the Duke of Portland and a smaller portrait of Mrs. Garrett-Anderson, M.D., and portraits by Mr. J. J. Shannon, Sir George Reid, and Mr. Watts were among the most conspicuous subjects in this branch of art. Mr. Watts also took first honors in subject painting with three pictures, the most successful of which was a group of Cupids called "Trifles Light as Air." Mr. Mark Fisher and Mr. Edward Stott, the latter with "A Winter Evening"—sheep feeding among the snow—presented the most interesting pictures in landscapes and scenes of rural life. The winter exhibition consisted of the works of Sir W. B. Richmond—495 pictures being shown.

The two exhibitions of the New English Art Club maintained the high standard of previous exhibitions, and of average merit were the exhibitions of the two water-color societies, of the Society of Oil Painters and of the Society of British Artists. An official announcement of the latter society proclaimed that in future its exhibitions would be confined to the work of members only. The third exhibition of the International Society of Sculptors, Painters, and Gravers, with Mr. Whistler at their head, showed a deterioration from its predecessors which had already been signalized in the second exhibition, the show of foreign productions being too fragmentary to form a record or realize the fascinating idea of internationality. Among numerous exhibitions at private galleries, that organized by Messrs. Agnew attracted considerable attention by the exhibition of Gainsborough's famous portrait of the Duchess of Devonshire, which was stolen in 1876 and recovered early in this year at Chicago. The Thirty-second Winter Exhibition of the Royal Academy was devoted to the works of British artists, deceased since 1850, and provided an excellent illustration of the various art movements during Queen Victoria's reign. Two hundred Spanish paintings, 39 of which were by Velasquez, formed an interesting exhibition at the London Guildhall, and the excellence of Spanish color painting was a revelation to the *incognoscenti* at the South Kensington Museum, where an exhibition of "Modern Illustration" attested the powers of native and foreign artists and wood engravers. American workers were represented by

Messrs. Pennell, Abbey, Storer Gibson, Cole, and Hutt. "That one touch of art (as well as of nature) makes the whole world kin" was evidenced by the entertaining character sketches of London outdoor life by Mr. Yoshio Markino, a young Japanese artist, in a hybrid assimilation of oriental and occidental artistic methods. Mr. Markino received his Anglo-Saxon training chiefly in the art school attached to the University of California and at the Central School, Regent Street, London. Among the variabilia of art happenings in London, the banquet to Sir John Tenniel on his retirement from *Punch*, after fifty years' service, was an artistic event and a tribute worthy of its recipient.

Among art events in the United Kingdom outside London, the fine arts section of the Glasgow exhibition was a notable one in the chronicles of such enterprises, although the pictures and drawings were not hung to the best advantage. It is worthy of record that the avowed object of the exhibition was fulfilled—the endowment as a permanent building of the Art Palace, in which the collection was on view and which had cost over \$1,000,000. The thirty-first autumn exhibition at Liverpool produced some noteworthy pictures, local artists holding a very good position.

The Allan-Fraser Art College charmingly situated at Arbroath, Scotland, opened its first session in October. This college owes its institution to the benevolence of Mr. Patrick Allan-Fraser, an honorary member of the Royal Scottish Academy, who died ten years ago, leaving estates, the profits of which were to be devoted to the maintenance of an art college for poor but talented young artists of the United Kingdom. The Stratford-on-Avon Memorial Theatre was enriched by the bequest of William Ryland's (of Sheffield) original water-color drawings illustrating the life of Shakespeare from the cradle to the grave; the Birmingham Public Art Gallery received Mr. Ryland's unsold pictures. A collection of the drawings, engravings, and paintings of Thomas Bewick and of his pupils, Johnson, Clennell, *et al.*, were bequeathed to the city of Newcastle by the late Mr. J. W. Pearce, banker, of that city.

The National Gallery and the National Portrait Gallery received some notable additions by bequest and purchase, and the National Portrait Gallery of Ireland was presented by Lord Iveagh with Lawrence's fine portrait of Curran. That a ministry of fine arts is not looked upon as an impossibility in Great Britain was shown by a debate in the House of Lords in July, with regard to a proposed Fine Arts Commission similar in character and scope to the Fine Arts Commission of 1842, initiated by Albert, Prince Consort. Remarks by the Earl of Rosebery and the Earl of Wemyss on the government's attitude towards art and on art in general, were particularly pertinent. A bill was passed for the isolation of the National Gallery and its priceless collections from the dangers of fire. The list of honors and appointments which accrued to British members of the profession during the year was a lengthy one. The commission to paint the state portrait of the king fell to Mr. Luke Fildes, R.A., and the painting of the coronation picture was intrusted to Mr. Abbey, R.A. Mr. Emil Fuchs, an Austrian artist, received the commission for the designing of the new postage stamps. Notwithstanding commercial depression owing to the apparently unending Boer War, art sales were as numerous as ever and prices ran high. The highest price ever attained at an auction for a picture was reached with 14,050 guineas (\$73,762.50) for Hoppner's "Lady Louisa Manners," the picture eventually becoming the property of Mr. Altman, of New York.

Throughout Imperial Greater Britain the progress of art was distinctly marked in the reports of the art galleries, museums, and schools of the Indian Empire, of Australasia, of the Dominion of Canada, and even of disturbed Cape Colony. The Victorian Artists' Society (Australia) made an important alteration in its constitution to raise the standard of membership by a process of elimination. The work of Canadian artists was conspicuously brought to public attention at the Buffalo Exposition, forty-nine Canadian artists, of whom half were members of the Royal Canadian Academy, exhibiting eighty pictures. They were of high quality and thoroughly representative of the best work of the Dominion, exhibiting originality, broad and truthful treatment, and mastery of technique. The School Art Movement, inaugurated at Toronto three years since, has grown apace, and during 1901, nineteen organizations in as many school districts were actively engaged in the dissemination of art knowledge through the enduring medium of the public schools.

The French exhibitions of the old and new Salons were held at the same time under the same roof in different galleries in the Grand Palais des Beaux Arts, of the 1900 Exposition in the Champs Elysées, Paris. The exhibits of the old Salon (*La Société des Artistes Français*) numbered 4,812, of which 2,002 were paintings; the exhibits of the new Salon (*La Société Nationale des Beaux Arts*) comprised 1,960, of which 932 were paintings. Among the chief features of the old Salon were Constant's portrait of Queen Alexandra, and Léon Bonnat's portrait of President Loubet, Adolphe Lalire's "Abduction of Cupid by the Sirens," Louis Béroud's "Paradise Lost," E. Boutigny's "Marbot at Jena," P. Gervais's "Bacchus and Ariadne," and G.

Roche-grosse's "Queen of Saba and King Solomon." At the new Salon seven works by the late E. Cazin occupied the post of honor, and other notable pictures included Carolus Duran's "Ensign of the Fencing Master," Eugène Girardet's "The Upper Chamber," and Hagborg's "Old Fisherman." Later in the year the governing committee of *La Société des Artistes Français* passed a rule limiting the number of future exhibits to 1,600, and allowing no artist more than two works. This limitation seriously menaced another disruption of the society. At a general meeting a resolution was carried over the heads of the committee, raising the number of exhibits to 2,500, and demanding a revision of the statutes limiting the powers of the committee. A proposition to provide a number of small individual displays by representative artists was not accepted.

Friendly relations were reestablished between the Society of American Painters and the American Art Association of Paris; the midwinter exhibition of the latter body at their club-house on the Quai de Conti presented some admirable features. Two individual works in the French art world of 1901 are noteworthy. Mr. Ziem, the great painter of Venetian scenes, completed his painting of the naval fêtes at Toulon, a masterpiece and a *tour de force* in view of the fact that the artist is eighty years old. Mr. Jean Paul Laurens also completed his great work, "The Apotheosis of Colbert, Minister of Louis XIV.," which critics declare to be one of the finest historical and allegorical works existing. After exhibition in the Salon of 1902 the picture will be reproduced in Gobelins tapestry, to ornament the mairie of the Gobelins arrondissement.

At Prague, *L'Administration de la Société des Beaux Arts* held its sixty-first annual exhibition. At Munich, the combined forces of the Artists' Association and the Secession Society held an international exhibition from June to October in the Royal Glass Palace, the exhibition, attendance, and sales being highly satisfactory. International exhibitions were also held at Berlin and Venice, and an international fine arts section at the Turin Exposition of 1902 is announced. At Brussels the exhibition of the *Société des Aquarellistes Belges* held in the Cercle Artistique was a great success. While Belgium was well represented, international interest was evinced by fine works from Holland, Germany, Austria, Spain, and Great Britain. The famous Cercle Artistique was also the scene of an international exhibition of oil paintings and sculpture, and of several interesting individual exhibitions.

From Hungary the portrait paintings of F. E. László came into prominence. The works of Mr. Walter Crane were exhibited in the museum at Vienna and at Frankfurt. From Denmark the illustrated work of Kristian Kongstad attracted attention; from Switzerland that of Mr. Louis Dunki indicated the commanding position he holds among international artists, his work being in great demand by well-known Parisian publications. In Paris, also, the work of Mr. Garth Jones, an Englishman, in *La Revue Illustrée*, won high commendation.

The Louvre, Paris, received some valuable old masters from Baroness Nathaniel de Rothschild, and the Imperial Picture Gallery at Budapest, also received notable additions. Over two hundred water-colors by English masters were given to the Dresden City Gallery by an English lady. The Italian government voted \$720,000 for the famous collection founded by Cardinal Scipione Borghese and known as the Borghese Gallery, thus intervening and preventing the going to an American private gallery of Titian's "Sacred and Profane Love," for which it was said \$1,000,000 were offered. Mr. Pierpont Morgan, it was stated, had given \$500,000 for the Raphael known as "St. Anthony of Padua." Botticelli's "Madonna of the Thorns," discovered in the old Colonna Palace in 1899, was sold by Prince Chigi for \$65,000, and is now the property of Mrs. John L. Gardner, of Boston, by whose kind permission the picture was exhibited in London. Prince Chigi, under the Italian laws forbidding the exportation of national art objects, was sued for the sum obtained for the picture. An appeal resulted in the penalty being reduced to \$400; but the state reopened the case, which is still pending before the court at Perugia. The restoration, once again, of Leonardo da Vinci's "Last Supper" in the refectory of the old Convent of Sancta Maria delle Grange, was announced.

As supplemental or allied to the art of painting, the original, pleasing, and harmonious color scheme of the Buffalo Pan-American Exposition as devised by Mr. C. Y. Turner, of New York, is worthy of mention. Also to be noted are the various exhibitions of arts and crafts devoted to "decorated useful things instead of useless decoration" which were held in Berlin, Vienna, Turin, Dresden, Darmstadt, Glasgow, Newcastle-on-Tyne, and other European cities. One of the best of similar American exhibitions of the "minor arts" was that of the Association of Allied Arts in New York, where samples of Losanti (Cincinnati) and other United States ware, of porcelain painting, wood-carving, fire etching, leather-work, embroideries, silks, tapestries, etc., showed the standard of American craftsmanship. Other American exhibitions of arts and crafts are mentioned in the general list.

The obituary of the year included Arnold Boecklin, Swiss painter; Alexander Brodsky, Hungarian landscape painter; Henriette Browne, H.R.I., famous woman

painter; V. de Brozik, director of fine arts, Prague, and a well-known exhibitor at the Salon; Emile Cazin, French landscape painter; Walter Field, A.R.W.S., England; Kate Greenaway, English illustrator of children's books; William Hughes, English flower painter; G. W. Johnstone, R.S.A., English landscape painter; J. B. Macdonald, R.S.A., Scotch landscape painter; William Cosmo Monkhouse, English art critic; Edward Moran, the venerable United States versatile artist; Sir J. Noel Paton, R.S.A., English romantic painter; M. Toulouse Lautrec, a promising Parisian artist; George Smith, English genre painter; Gregory Lehmann, Russian portrait painter; Orlando Norie, English painter of military subjects; R. C. Leslie, an English marine painter and littérateur; David Law, English artist; and John Dalrymple, Scotch painter.

PALEONTOLOGY. See **GEOLOGY**.

PALESTINE. See **ARCHÆOLOGY**.

PALLAVICINI, EMILIO, lieutenant-general in the Italian army, died at Rome, November 15, 1901. He was born at Genoa in 1824, and entered the military academy at Turin in 1833. After graduating he entered the army, going in 1848 to take part in the campaign in Lombardy as one of a regiment of Bersaglieri, and was made a captain in 1851. During the wars of 1859 he distinguished himself at San Martino, where he won a medal for bravery, and was made a major after the peace of Villafranca. In 1862, as colonel of Bersaglieri, he fought against and succeeded in capturing Garibaldi at Aspromonte. After a series of campaigns against the South Italian brigands, he was made major-general, and then lieutenant-general; and in 1888 was placed in command of the Roman army corps. He became a senator in 1880, and from 1890 to 1893 was military aide to King Humbert.

PALMA, TOMAS ESTRADA, was elected first president of Cuba in December, 1901. He was born at Bayamo, province of Santiago, Cuba, in 1835. He studied law at the University of Seville, but did not practice. In the Cuban revolution of 1868-78—the "Ten-Years' War"—he took an active part, and upon the death of General Carlos Manuel Cespedes, General Palma, who had risen in rank through his services in the field, was made president of the provisional government. In 1877 he was captured by the Spanish troops and imprisoned, but upon the close of the rebellion was released. Afterwards he went to Honduras, where he became prominently identified with the Federal party, and was made postmaster-general of the republic. At the outbreak of the Cuban insurrection in 1895 General Palma, who previously had gone to the United States, was selected as foreign envoy of the revolutionary party, and he became the head of the insurgent bureau—the so-called "Junta"—in New York City. In this position he worked indefatigably for the cause, purchasing supplies, chartering steamers to carry filibustering expeditions, and aiding in the direction of the campaigns in the field. At the close of the Spanish-American War, when the United States had established military rule in Cuba, he retired to his home in Central Valley, N. Y., and conducted there a school known as the Estrada Palma Institute. General Palma represents the Cuban party, as opposed to the element favoring American annexation, but is favorable to close treaty relations with the United States.

PANAMA CANAL. See **NICARAGUA CANAL**.

PAN-AMERICAN CONFERENCE. See **MEXICO** (paragraph Pan-American Conference).

PAN-AMERICAN EXPOSITION. This exposition was held in Buffalo, N. Y., from May 1 to November 2, 1901. Subsequent to the Cotton States Exposition, held in Atlanta, Ga., in 1895, the desirability of holding an exposition near the Niagara River, "to illustrate the marvelous development of the Western Hemisphere during the nineteenth century, by a display of the arts, industries, manufactures, and the products of the soil, mine, and sea," was determined upon by the citizens of Buffalo. It was originally intended to hold this exposition during 1898, but the war with Spain intervened, and the enterprise was postponed until 1901.

A site, covering 350 acres, was chosen in the northern part of the city. The grounds, which included part of the park system of the city, were made attractive by flowering shrubs and trees of rare species, until a landscape effect of extraordinary beauty was attained. An irregular lake, half a mile in length, connected with artificial canals and lagoons, constituted one of the most pleasing scenic features of the grounds. The site of the exposition was readily accessible by electric cars, and was not more than twenty minutes distant from the business centre of the city, and as direct communication was had at the various entrances with the steam and electric lines to Niagara Falls it was possible to visit that cataract with great ease.

The principal buildings of the Exposition were arranged around a broad court, having the form of an inverted letter T. The transverse section of this court, called the Esplanade; ran east and west, and was over 1,700 feet between the extremes. The Court of Fountains, which was north of the Transverse Court, was

500 feet wide and 200 feet from north to south. The approach from the south to the Esplanade was over a Triumphal Causeway that spanned an arm of a small body of water forming part of the canal waterway system and known as Mirror Lake. At the north end of the broad court was the famous Electric Tower, while between it and the Esplanade, in the Court of Fountains, was the Aquatic Basin, 225 feet wide by 565 feet long, which contained numerous fountains, and at the south end terminated in the Fountain of Abundance, designed by Philip Martiny. In the terraces surrounding the court were numerous figures in staff, designed by well-known artists. It was early decided that the setting of the Exposition should be developed on a formal ground plan introducing architecture, sculpture, and painting as allied subjects. Accordingly the entire matter was placed in charge of a board of architects, of which Mr. John M. Carrère was chosen chairman, and Mr. Karl Bitter and Mr. C. Y. Turner were respectively made directors of sculpture and of color. It was agreed that the style of architecture should be a free adaptation of the Spanish Renaissance, that apparent roofs with overhanging eaves should be used in preference to flat roofs with cornices and balustrades; that color and decorative sculpture should be introduced freely in the treatment of the buildings, and that the character of the Exposition should be as gay and festive as possible.

Considering the principal buildings briefly, and beginning at the south of the Esplanade, mention should first be made of the *Triumphal Causeway*, which served as an entrance to the great court, and also had for its architectural purpose the balancing of the Electric Tower at the north end. The four pylons at the corners of the causeway were 40 by 50 feet in size, and 116 feet from the water level to the base of the equestrian statues, and in color were made to represent stone. Surmounting the pillars were colossal figures by Karl Bitter, representing Peace and Power. These consisted of a youth on the back of a horse thirty feet in height, which reared above a mass of trophies symbolic of feudalism, slavery, and subordination to tyrannical power, the whole expressing the triumphant struggle of the people of the United States to free themselves from the institutions of despotic ages and governments. Peace, with a lyre in one hand and a banner in the other, was emblematic of the peace which is the fruit of such a victory, while Power, with a shield and standard, was representative of the power which such a struggle engenders. Garlands of shields and colored flags connected the two pylons. Passing to the right, the next of the larger buildings was that designed by Mr. J. Knox Taylor for the *United States Government*. It closely resembled the Cathedral in the City of Mexico, although the columns in the portico showed the influence of the modern French spirit, and a quadriga on the dome, as well as its general form, which was distinctly that of an exposition building, prevented it from being a misapplied copy. It was connected with two flanking square pavilions, in one of which were the exhibits of fisheries, and in the other those of agriculture. The *Ethnology Building*, by Mr. George Cary, was immediately beyond at the eastern junction of the grand Esplanade and the Court of Fountains. It was circular in plan, with main entrances on the diagonal axis, and between and connecting which was a continuous colonnade with a decorative frieze over the windows. Over each entrance was a pediment containing an ethnology group in staff forming the decorative motive of the tympanum, and back and above was Proctor's Quadriga. The building was covered by a dome, suggesting that of the Pantheon at Rome. From the northern pavilion of the Government Building, as well as from the Ethnology Building, were colonnades which led to the *Manufactures and Liberal Arts Building*, which was designed by Mr. George F. Shepley. It occupied a space 350 by 500 feet, with a courtyard in the centre 132 by 175 feet. From the main entrance of the building on the south was a high dome, flanked by four square open towers. Broad steps between large groups of statuary led up to the entrance, which consisted of a high arch above two tall columns on either side. Above the arch, elaborate relief work enriched the gable. Statues symbolizing the various arts and industries were placed in niches at the angles of the several open towers around the dome. The general treatment was a free adaptation of the Spanish Renaissance. To the north, and across the mall, was the *Agricultural Building*, also designed by Mr. Shepley. It was 500 feet in length on the mall, where the principal entrance was, while the front, facing the Court of Fountains, was 150 feet in width. The decorations represented fruit, vegetables, and flowers, thus expressing the character of the building, and the large corbels were in the form of heads of animals of the field. This idea was also carried out in the decoration of the cornices. The dominant feature in the group of buildings was the *Electric Tower*, at the north end of the Court of Fountains. It was designed by Mr. John G. Howard, and its total height was 389 feet. The general design was essentially American, although use was made of classic and Renaissance forms. The main body of the Tower was 80 feet square and 200 feet high, and terminated in a domed cupola, crowning which was a figure 16 feet high, representing the Goddess of Light, designed by Mr. Herbert Adams. At the base of the Tower and on

the sides were two colonnades 75 feet high, which swept southward, forming a large semi-circular space opening towards the Court of Fountains. The motives underlying the decorative features of the Electric Tower all tended to emphasize the fact that the age of electricity was symbolized in its creation, and accordingly this fact was accentuated by a lavish display of electric power. The source of this power was Niagara Falls, and this was suggested not only by the fountain and the basin at the base of the Tower, but by various groups of statuary in the wings, which had been designed to represent the great bodies of water which are tributary to the cataract. These groups were Lake Michigan, Lake Superior, Lake Ontario, Lake St. Clair, Lake Huron, and Lake Erie, while the spandrels of the niches in the south face of the Tower, and the smaller ones above the arch of the entrance on the north side, were chosen to symbolize the four rivers, Niagara, Buffalo, St. Lawrence, and St. Clair. The *Electricity Building* was to the west of the Electric Tower, and was designed by Messrs. Green and Wicks. It was 500 feet long by 150 feet high, and covered 75,000 square feet. It was designed in the Spanish-mission style of architecture, with Renaissance features. The entrances in the northern and southern façades were prominent features, and consisted of high arches between tall towers while the towers themselves carried ornamented cupolas. The four corner towers were domed pavilions, and the spaces between the towers were embellished with colonnades and grilled windows. The roofs had broad overhanging eaves, and a liberal use of modeled relief work and color greatly added to the beauty of the building. Directly south of this building was that devoted to *Machinery and Transportation*, which was also designed by Messrs. Green and Wicks. The building was 500 feet long and 350 feet wide; the general style of architecture followed was the Spanish Renaissance. The façade of the building presented an arcaded, cloister-like appearance, the oak-timbered overhanging eaves producing the shadow. In the centre of the face were placed the important entrances. On the north and south façade the entrances were flanked with towers, which formed the most notable feature. The roofs were covered with typical Spanish-mission tile, and the window openings were copies of the wrought iron work peculiar to the Spanish style of building. Next in order came the *Temple of Music*, which occupied the same relative position on the west side of the Esplanade as did the building devoted to ethnology on the east side. It was designed by Messrs. Esenwein and Johnson. The ground plan of the building was square, each side being 150 feet. It was surmounted by a dome 180 feet high, in proportions suggestive of the dome of the Pantheon in Rome. The treatment of the building was highly ornate, including many pilasters, sculptured in relief, while over each of the four pediments was a sculptured group. It was in this building that President McKinley was shot. At the extreme west of the Esplanade, and south of the Temple of Music, was the *Horticultural Group*, including the Horticulture Building and the Graphic Arts and Mines Pavilions, which corresponded to the government group on the east side of the Esplanade. The group was designed by Mr. R. S. Peabody. The *Horticulture Building* proper was 220 feet square, with a dome and lantern rising to 240 feet. The building was formed on the plan of a Greek cross, with four large arches on in principal axes, and small octagonal pavilions filling in the corners. In style the architecture was suggestive of buildings of northern Italy. The two pavilions, or loggias, in which the exhibits of the *Graphic Arts* and *Mines* were shown, were reproductions of the Villa Madonna in Rome. In addition to the foregoing was the *Stadium*, at the northeast corner of the grounds, which was used for the outdoor athletic sports. The *Propylaea* consisted of a colonnade surmounted by a sort of pergola and flanked by two large archways, which gave access from the railway station. It was at the extreme northern end of the grounds. The *New York State Building*, designed by Mr. George Cary, was in the Greek Doric style of architecture, and was built in white Vermont marble in the form of a rectangle about 130 feet long by 80 feet wide, and 50 feet high. At the close of the Exposition it passed into the possession of the Buffalo Historical Society. The *Art Building*, of rough red brick, was designed by Messrs. Green and Wicks, and was in the Ionic style of architecture. It was 220 feet long, 105 feet wide, and 34 feet high, and remains as a memorial of the Exposition, having become the home of the Buffalo Fine Arts Academy.

Among the minor buildings were the *Acetylene Building*, in which were the exhibits of the acetylene industry; the *Bazaar Building*, for the sale of *bijoux* and souvenirs; the *Dairy Building*, in the style of a Swiss chalet; the *Forestry Building*, of logs; the *Mission Building*, in the style of the old Spanish missions of California; the *Ordnance Building*, forming an annex to the Government Building; the *Service Building*, in which were the offices of the Exposition authorities; and the *Woman's Building*, a frame structure, formerly the home of the Country Club. There were also numerous State buildings, erected by the Dakotas, Illinois, Michigan, Minnesota, New Jersey, Ohio, Pennsylvania, Wisconsin, and the New England States, as well

as the special buildings of Chile, Cuba, Ecuador, Guatemala, Honduras, Mexico, Porto Rico, and Santo Domingo.

The color scheme, which was one of the special features of the Exposition, was designed and directed by Mr. C. Y. Turner, who endeavored to represent the fierce struggle of man to overcome the elements. Accordingly, the buildings were grouped so that as one went into the grounds, on the left were arranged the buildings which represented the elements, while those on the right represented man and his affairs, or that which man had gained after long years of strife with the elements. The struggles were represented by heavy, deep coloring, of red, blue, green, and gold, which graduated gently but firmly in tints, until the Electric Tower was reached, where it again began in a deep green, as near the color of Lake Erie as it was possible to get it. The Tower itself was in light ivory, with sculpture work on the four corners, and was tinted with blue, green, and gold, which grew fainter as the top was reached, terminating in a gilt figure of the Goddess of Light, which represented all that man had accomplished over the elements. The color treatment gained for the Exposition the name of the Rainbow City, or the Tinted City.

The sculpture was likewise made subordinate to the general plan, and was under the direction of Mr. Karl Bitter. The treatment of the grounds suggested the necessity for sculpture at different points where it had been placed, and the sculpture in turn was so designed as to belong clearly where it was set. At the entrance of the Exposition, the Triumphal Causeway, which was perhaps the most ornate feature, represented the apotheosis of the United States, an allegorization of national pride; while the Electric Tower at the other end symbolized the great waters, suggesting that the importance, growth, and prosperity of Buffalo were due chiefly to the Great Lake system and waterways on which it was located. On the west side of the Esplanade the subject of Nature was considered, and there the Fountain of Nature, with its attendant features, by Mr. George T. Brewster, was placed, while on the east side Man and his Institutions received attention, most conspicuously by the Fountain of Man, by Mr. Charles Grady. All of the sculpture was in white staff.

The usual amusement features were collected in the northwest portion of the grounds on two streets, which were at right angles to each other, and were known as the Picturesque Midway, or Lane of Laughter. They were divided into those that were distinctly amusement and those that were educational. The latter included the ethnological entertainments, among which were Alt Nürnberg and the Hawaiian, Indian, Japanese, Mexican, and Philippine Villages.

A series of commemorative stamps was issued by the United States Post-Office Department, and were current during the life of the Exposition. They were of the following denominations: 1, 2, 4, 5, 8, and 10 cents, and in the same colors as the regular issue. A special flag was designed for the Exposition by Miss Adelaide J. Thorpe. It was quadrangular in shape, and divided into three sections. The triangle nearest the staff was blue, with the North Star upon it in white. The triangle on the opposite corner was red, on which the four stars of the Southern Cross were set in white. The parallelogram between the triangles was white, on which an eagle in gold was depicted.

A jury of awards, under the chairmanship of Mr. Henry S. Pritchett, examined the exhibits during July and August. Later the Exposition authorities announced that 4,577 awards were made, as follows: gold medals, 887; silver, 1,159; bronze, 1,147; and honorable mentions, 1,384.

The total attendance at the Exposition was 8,120,048, of which number 5,306,859 were paid admissions. At the beginning of the Exposition the attendance was exceedingly light, and the first week in June showed only 60,000 admissions. These steadily increased, until in the first week in July the admissions reached 168,000, and the first week in August showed over 237,000. But with the death of President McKinley came a decline, and the attendance steadily diminished, until the close of the Exposition.

The cost of the Exposition was \$8,860,757.20. The total receipts from admissions were \$2,467,066.88, and the receipts from concessions were \$3,011,522.76, leaving a deficit of \$3,326,114.69, with assets amounting to \$146,454.15 still owing the company. At the close there were due for operating expenses and construction work \$577,945.73, together with a balance of \$174,976 to the first-mortgage bondholders, and \$500,000 to the second-mortgage bondholders. The creditors of the Exposition sought relief in the courts, and a receiver was appointed towards the close of the year.

The history of the Exposition can be learned from a *Pan-American Handbook* (Buffalo, 1901), and the monthly magazines, especially the *World's Work* for August, and the *Cosmopolitan* for September, the entire issues of which are devoted to the Exposition.

PANCREON. A new digestant termed pancreon is obtained by the action of tannic acid on pancreatin. It occurs in the form of a gray, odorless powder.

One gramme of it will digest 85 out of 100 grammes of albumin with which it is mixed, in 15 minutes, at a temperature of 40° C., in a weak alkaline medium. It is also amylolytic and emulsifying. It is said to be capable of resisting the action of the gastric juice for 5 hours. It is prescribed for gastro-intestinal affections, in small doses repeated after each meal.

PARAGUAY, an interior South American republic, lying between Brazil and Argentina. The capital is Asunción.

Area and Population.—The estimated area of the 23 districts comprising Paraguay is 98,000 square miles; according to the census of 1899 the population was 655,571, including 100,571 Indians. There were 18,183 foreigners. Asunción had 51,719 inhabitants, of whom 4,541 were foreigners. The state church is the Roman Catholic. Primary instruction is free and nominally compulsory.

Government.—The chief executive is a president, who is assisted by a ministry responsible to the congress; this body, upon which devolves the legislative power, consists of a senate and a chamber of deputies. The president for the four-year term beginning November, 1898, is Señor Emilio Aceval. The army, maintained chiefly to preserve internal order, numbers about 1,600 men.

Finance.—The gold peso is worth approximately one dollar in United States money; but Paraguayan finance is on a paper basis, and the value of the paper peso, the chief circulating medium, is only about 14 cents. Revenue, which is derived mainly from customs, and expenditure were estimated for 1900 at 8,065,782 pesos and 8,122,180 pesos respectively, both figures representing currency; the receipts from import and export customs, however, for that year, have been reported at 8,428,705 pesos, and from internal taxation 1,122,460 pesos. In 1900 the total public debt, face value, was placed at over \$41,300,000.

Industries, Commerce, etc.—The principal industry is cattle-raising. The estimated number of live stock at the beginning of 1901 was 2,743,665; of this number, 2,283,039 were cattle, as against 912,245 in 1887. The most important agricultural product is yerba maté, or Paraguay tea. In 1900 the number of manufacturing establishments reported in the country was 1,094, with an aggregate capital of 135,448,066 pesos. According to the president's message of April 1, 1901, the values in currency of the imports and exports in 1900 were 20,977,419 pesos and 21,382,895 pesos respectively; according to a German report, the values in gold pesos were 2,555,925 and 2,652,070 respectively. The leading imports are textiles, wines, and rice; the chief exports, yerba maté, hides, timber, and oranges. Great Britain leads in trade importance, followed by France, Germany, Italy, and the United States. There is one railway, from Asunción to Pirapó, 156 miles distant. In 1899 the post-offices numbered 139. During 1900 the telegraph system was extended.

PARKER, EDWIN W., bishop of the Methodist Episcopal Church, died June 4, 1901, at Naini Tál, British India. He was born at St. Johnsbury, Vt., January 21, 1833, and entered upon missionary work at an early age. During his almost forty-two years of continuous service as a Methodist missionary he traveled all over India, and was chosen bishop of Southern Asia shortly before his death.

PARKER, HORATIO GILBERT, novelist, published *The Right of Way* in 1901. He was born at Ontario, Canada, November 23, 1862, and studied for the ministry at the University of Toronto, and later at Trinity College, Toronto, where he also lectured. Afterwards he went to Australia, becoming associate editor of the *Sydney Morning Herald*, in 1886, and lecturing throughout the colony. He then devoted himself to traveling, making extensive journeys through the South Sea Islands and northern Canada, and at the same time wrote for newspapers and magazines. He has written an adaptation of *Faust*, his first book, (1888); *The Vendetta* (1889); *No Defence* (1889); *Round the Compass in Australia* (1892); *Pierre and His People* (1892); *The Trail of the Sword* (1894); *When Valmond Came to Pontiac* (1895); *The Seats of the Mighty* (1896); *The Battle of the Strong* (1898); and a number of other novels. He was elected to the British parliament, from Gravesend, in 1900.

PARTHENOGENESIS, ARTIFICIAL. See **PHYSIOLOGY, CHEMICAL.**

PASSY, FREDERIC, French economist and member of the Institute, received in 1901 one-half of the Nobel Prize (*q.v.*), for the encouragement of peace and arbitration. He was born in Paris, May 20, 1822, the son of a former court councillor, Félix Passy. After being admitted to the bar, he was attached to the state council from 1846 to 1848, interesting himself especially in the study of political science. It was his strong advocacy of the principles of peace that first attracted attention to M. Passy; both in his writing and in the numerous conventions he has been instrumental in calling together, he has fought against war as a method of settling international disputes. He has been active in politics, though seldom successful as a candidate for any of the legislative bodies. In 1881 he was made a member of the Chamber of Deputies. He was one of the founders, and for a long time secretary,

of the International Peace League; in 1877 he was elected to the Academy of Moral Science; and in 1880 was made a member of the Legion of Honor. His writings on economic subjects include: *Mélanges Economiques* (1858); *Leçons d'Economie Politique* (1860); *De l'Influence de la Contrainte et de Liberté* (1866); *la Guerre et la Paix* (1867); *Communauté et Communisme* (1869); *De l'Importance des Etudes Economiques* (1873); and *Le Petit Poucet du XIX. Siècle* (1881); and many addresses and papers in the French reviews.

PATON, Sir JOSEPH NOEL, British artist, died in Edinburgh, December 26, 1901. He was born in Dunfermline, Scotland, December 13, 1821, and studied art for a time in 1843 at the Royal Academy, London. In 1845 he was awarded a premium at the Westminster Hall competition for a cartoon, "The Spirit of Religion," and two years later won a prize of £300 for two pictures, "Christ Bearing the Cross" and the "Reconciliation of Oberon and Titania." This last picture was purchased for the Scottish National Gallery, and from that time Paton was one of the most popular of British painters. The list of his paintings that attracted attention, largely on account of the deeply religious spirit which they exhibited, extends far beyond two score; and besides this work, he executed in sculpture two notable groups, and published two volumes of poems, *Poems by a Painter* (1862), and *Spindrift* (1866). Among his pictures that met with popular appreciation and were frequently reproduced, are: "The Dead Lady" (1854); "Dawn: Luther at Erfurt" (1861); "The Man of Sorrows" (1875); "The Man with the Muck Rake" (1877); "Thy Will be Done" (1879); "Vade, Satana!" (1888); "De Profundis" (1892); and "Queen Margaret of Scotland reading the Gospel to Malcolm Caenmore" (1900). Through engravings his work reached a large class which ordinarily is not interested in art; but his wide culture and fertile imagination preserved him from becoming altogether a painter for the masses. In early life he was a close friend of such men as Ruskin and Millais. In 1865 he was appointed queen's limner for Scotland, and in 1867 was knighted.

PAUNCEFOTE, First Baron, Sir JULIAN PAUNCEFOTE, British ambassador to the United States, was born at Munich, Germany, September 13, 1828, and was educated in Paris and Geneva and at Marlborough College, England. In 1865 he was made attorney-general of Hong Kong, and acting chief justice there in 1869. He became chief justice of the Leeward Islands in 1873, and a year later legal assistant under-secretary of state for the colonies. He succeeded Lork Sackville-West as British minister to the United States in 1888, and in 1893 he was raised to the rank of ambassador. In 1894 he was made a privy councillor, and in 1899 was raised to the peerage. He was a member of the Hague peace conference in 1899, and in 1901 was chosen president of the Permanent Board of Arbitration. In 1901 he negotiated with Mr. John Hay (*q.v.*), the American secretary of state, an Isthmian Canal treaty, which was signed November 18, and ratified by the United States Senate on December 16.

PAUPERISM. See CHARITY ORGANIZATION.

PAVEMENTS, STREETS, AND ROADS. Bituminous macadam pavements were laid during 1901 in Brockton, Cambridge, and Holyoke, Mass., Pawtucket, R. I., and Salem, N. J. The amount laid in each city was small, ranging from 596 square yards in Cambridge, to 3,794 square yards in Salem. This new style of pavement, though largely experimental, resembles, in some respects, the well-known tar concrete sidewalks, and, in others, sheet asphalt. It is probably a great improvement over the so-called tar macadam pavements which have been laid in a few cities of Great Britain, Canada, and the United States. Bituminous macadam differs from ordinary macadam (1) in having the broken stone components in sizes carefully graded so as to reduce the voids to a minimum, instead of being quite uniform in size; and (2) in the use of a bituminous cement to bind the stone together, instead of relying on the cementing powers of stone dust and selected earth for that purpose. It differs from both tar macadam and sheet asphalt, according to the statements of the producers, because in the former two classes of pavement the bituminous substances simply support the broken stone or sand, while, in the bituminous macadam, the bituminous material is used to protect the stone or mineral matter from the action of water and weather, to deaden the shock and abrasive effect of traffic on the stone, and to bind the mineral particles together. None of the pavements in the cities named were laid until well into the year 1901, so their wearing powers have not yet been tested. Nor has sufficient pavement been laid to determine its eventual price. It is expected that it will cost more than macadam and less than sheet asphalt; but its relative economic efficiency must be determined by the cost of repairs, as well as of construction, and by its life. Further details regarding this pavement, taken from a paper by Mr. F. J. Warren, are given in the *Engineering Record* of January 25 and the *Engineering News* of January 30, 1902. In the former publication, brief reports from the city engineers where the pavements were laid, are given.

Wood block pavements, differing in some important details from those formerly tried, were laid in several American cities in 1901. While wood blocks are extensively employed for pavement abroad, and were once widely used in the United States and Canada, they fell into disfavor a number of years ago. This was due to the use of unsuitable wood, improperly prepared, and laid on yielding foundations. A few American cities have laid wood blocks more in accordance with modern engineering methods, and with fair results. This has been particularly true at Indianapolis, where the blocks were creosoted to protect them from rotting before being laid. In the pavement already mentioned as laid in 1901, the blocks are impregnated with a compound of creosote and resin, the former as a preservative, and the latter to decrease slipperiness. They are laid on a foundation of concrete 6 inches in depth, with or without a cushion coat of sand between the blocks and the concrete, as the local engineer may prefer. The first pavement of this sort in Boston, having an area of 1,360 square yards, was laid in 1900. After a service of one year the local official in charge stated it had proved satisfactory in all respects except slipperiness, and that "in this particular it is no better than asphalt; but it is remarkably free from noise." In 1901, about 14,000 square yards additional, of this same kind of wood blocks, were laid in Boston, all under a 10-year maintenance guarantee. In the hopes of reducing slipperiness, a small portion of the pavement of 1901 was laid with blocks cut so as to give a joint space one-half inch wide to a depth of $1\frac{1}{2}$ inches, and a Portland cement filling was poured into the space. It should be added that the trouble from slipperiness, as in the case of asphalt, is chiefly on grades, and in wet or frosty weather. The Boston experience with this kind of pavement was described at length by Mr. Bertrand T. Wheeler, at that time superintendent of streets, in a paper read before the American Society of Municipal Improvements at Niagara Falls, in October, 1901. At the same time and place, Mr. F. A. Kummer read a paper on *Wooden Pavements at Home and Abroad*, with special reference to the kind of wood pavement just described as laid in Boston. The two papers are printed in the *Proceedings* of the society named.

Asphalt pavements continue to grow in popularity and use; but have met with some strong opposition of late on account of the alleged arbitrary methods and high prices of the asphalt combination. Late in 1901 the so-called Asphalt Trust went into the hands of a receiver. Brick pavements are gaining steadily in many sections of the country. Naturally they are used most in the north central States, where paving bricks are manufactured in large quantities; but "pavers" are also made in the east, and are used quite extensively in a number of eastern cities. Neither brick nor asphalt has been used to any extent in New England.

A marked feature of municipal work is the narrowing of the carriage ways of over-wide streets and throwing the space thus gained into sodded strips adjoining the sidewalks. Many of our newer cities have streets far wider than the traffic demands, and at the same time have comparatively few well-paved streets. By reducing the width of the carriage-ways a given number of square yards of pavement will cover an increased mileage of streets, reduce maintenance charges, and give an opportunity for more grass and trees. The movement is very properly known as "parking city streets." Among other places, it has been carried out at Columbus, Ga., and Hornellsville, N. Y.

Highway Improvement, or the construction of improved country and suburban roads, either directly by the State, or under more or less State control, and with a portion of the expense met by State funds, is being continued in Massachusetts, Connecticut, New York, and New Jersey. In the first two States the work is in charge of State highway commissions; in New Jersey there is a single road commissioner; in New York, the work is under the direction of the State engineer. In Canada, there is a provincial instructor in road making, who publishes reports annually. New York State was the latest of the four named above to enter upon road improvements. In the last report of the State engineer the total appropriation for good roads for the four years 1898-01 is given as \$670,000. At the close of the season of 1901 there had been completed 60 miles of roads, mostly or all macadamized, and, in addition, 110 miles were under construction. Half of the expense of the New York work is met locally. In Massachusetts, from 1893 to 1900 inclusive, 296 miles of improved road were built by the highway commission. From 1894 to 1900, inclusive, the State appropriated \$3,500,000 for road construction and repairs. During 1900 the average cost of a mile of improved road was \$8,957 for macadam, and \$7,074 for gravel. This includes an improved carriageway 15 feet wide, painted guard rails along steep embankments, and culverts of vitrified iron pipe or of masonry, where required.

Street Sprinkling by means of trolley cars is being extended to cover the whole width of the pavement, instead of merely that portion between and directly adjoining the tracks. In a form of sprinkler reported as in use, in 1901, the sprinkling between the curbs and the tracks is done, one side at a time, by means of perforated,

swinging pipes, attached to the side of the trolley car, and supplied from a water tank having a capacity of 2,000 gallons. If the arm strikes a vehicle it swings back against the car. A sprinkler pipe attached to the front of the car sprinkles the space between the tracks in the ordinary manner. In another type of sprinkler, designed for similar service, electric pumps are mounted on the car, and supply water to two sprinkler heads, which are located one on each side of the car, beneath the centre. Both styles of sprinklers were reported as in use at Colorado Springs, Colo. One of the great advantages of either sprinkler is the facility with which the amount of wetting given the streets may be regulated. The tendency with horse-cart sprinklers is to apply too much water.

PAYNE, HENRY C., was appointed postmaster-general of the United States, December 17, 1901, to succeed Charles Emory Smith, resigned. He was born at Ashfield, Mass., November 23, 1843, and was educated at Shelburne Falls (Mass.) Academy. After his removal to Milwaukee, Wis., in 1863, he entered politics and for a time served as chairman of the Republican State committee, retiring in 1892. From 1876 to 1886 he was postmaster of Milwaukee. Since 1889 he has been president of the Milwaukee Electric Railway and Light Company; he was president of the American Street Railway Association in 1893-94; and in 1893-95 was receiver of the Northern Pacific Railway.

PEARSONS, DANIEL KIMBALL, an American capitalist and philanthropist, whose numerous gifts to the small colleges of the United States during the last few years have attracted the attention of educators, and whose donations to ten institutions during 1901 amounted to \$555,000, was born at Bedford, Vt., April 14, 1820. He was educated at Dartmouth College and at the medical school of Woodstock, Vt. The difficulty he experienced in getting an education led Dr. Pearsons in later life, after he had accumulated a fortune by real estate transactions in Chicago, to announce that he would dispose of his wealth in gifts to small and comparatively obscure colleges. Among the largest of his gifts have been \$280,000 to the Chicago Theological Seminary, \$400,000 to Beloit (Wis.) College, and \$50,000 to Whitman (Wash.) College. Altogether he has contributed more than \$3,500,000 in this way, generally on condition that others should also contribute.

PEEK, Sir CUTHBERT EDGAR, English scientist, died at Brighton, England, July 5, 1901. He was born in England in 1855 and was educated at Eton and at Cambridge University. He became interested in meteorological and astronomical observations, and maintained a station on his estate at Rousdon, publishing each year valuable scientific bulletins. As a member of the council of the Royal Geographical Society, as honorary secretary of the Anthropological Society, and as one of the council of the Royal Meteorological Society, he materially advanced the interests of all; he visited remote Iceland and accompanied an expedition to Queensland at the last transit of Venus.

PENNSYLVANIA, an eastern State of the United States, has an area of 45,215 square miles. The capital is Harrisburg. Pennsylvania was one of the original thirteen States. The population in 1900 was 6,302,115, while in June, 1901, as estimated by the government actuary, it was 6,414,000. The population of the five largest cities in 1900 were: Philadelphia (the third largest city in the United States), 1,293,697, an increase of 246,733 since 1890; Pittsburg, 321,616; Allegheny, 129,896; Scranton, 102,026; and Reading, 78,961.

Finance.—The total receipts for the year ending November 30, 1901, were \$17,727,432.46; the expenditures were \$16,669,390.05, leaving in the treasury when taken in connection with the previously existing surplus, \$7,708,022.18. The State debt at the end of the year was \$6,815,299.02, of which amount \$6,681,150 was bonded. The total value of real estate in the State as returned for taxation was \$3,069,371,624.

Industries.—From the preliminary reports of the census of 1900 it appears that there has been a large growth in the manufacturing industries of Pennsylvania during the decade. In 1890 there was invested in the 39,239 manufacturing and industrial establishments reporting a capital, exclusive of capital stock, of \$991,243,115. In 1900 the number of industrial establishments had increased to 52,185, and the amount of capital invested to \$1,551,548,712. The capital invested in 1900 was distributed as follows: In land, \$148,768,571; in buildings, \$227,035,804; in machinery, tools, and implements, \$392,150,856; and in cash and sundries, \$783,593,481. In 1890 the number of salaried officials and clerks was 90,169, but in 1900 this number had decreased to 47,439. Nevertheless, the salaries paid annually had risen from \$42,215,788 to \$48,605,173. In 1890 the total number of industrial wage-earners was 570,393, drawing wages aggregating annually \$263,375,215. In 1900 the number of wage-earners had increased to 732,834 and the wages paid to \$332,072,670. Of the wage-earners in 1900, 574,606 were men, drawing wages amounting to \$293,697,372; 126,093 were women, drawing wages amounting to \$33,067,828; and 33,135 were children under 16, drawing wages amounting to \$5,307,470. The gross value of the manu-

facturing products of the State in 1890 was \$1,331,794,901, while in 1900 it was \$1,835,104,431. In 1900 the cost of material used in manufactures was \$1,042,561,628, while miscellaneous expenses aggregated \$134,344,269. Both in 1890 and 1900 Pennsylvania was the second State in the Union, both as to population and in the value of the products of its manufactures.

Railway Franchise Laws.—Perhaps the most remarkable series of legislative acts passed in the United States during the year, and certainly those to which most public attention was directed, were the laws enacted by the Pennsylvania legislature in May and June, 1901, giving to rapid transit companies upon the approval of the local authorities concerned, the right to construct and operate, without franchise compensation to city, county, or State, railways on, above, or below the earth along the course of any street or streets not already preoccupied, in each and every city of the commonwealth. The provisions of the most important of these bills are given below, and the practical significance of the bills, at least as popularly judged, was made known both at the time and by subsequent proceedings taken under the bills. The first bill approved June 7 enacts that five or more persons may form a company to construct and operate a street railway on any street upon which there was not already a railway at the time the law passed. But if a charter was granted to a company to build such a road, then no other charter covering the same roads could be granted to any other company within the time during which by the provisions of the act the company first securing the charter had the right to commence and complete its work. But the company receiving the prior charter from the State must within two years from that time obtain also the consent of the local authorities concerned. The company might then "sell or lease their road and franchises or parts thereof, to traction or motor power companies, or to other passenger railway companies, or acquire the roads, property, and franchises of other railway companies by lease or purchase." Such companies moreover might make extensions on any street or highway where a track was not already laid and in daily constant use. They might furthermore abandon the route to which their charter gave them vested rights; and then any other company might build on that route, provided that this alternative company made compensation to the prior corporation having "vested rights." If, however, the prior company really decided to build along the route allowed it, it must complete the building within five years, and no street passenger railway company was to be authorized or permitted under any circumstances to connect its tracks with a locomotive railway company or to interchange its cars or form a continuous route with any locomotive railway company. The second bill approved also on June 7 reenacted several of the provisions of the first law, and stated in addition that companies acquiring charters with the consent of the municipal authorities, might build railways, either elevated or underground or partly elevated or partly underground, and that such underground or elevated roads might be built above or below or across the same route along which surface roads were already constructed or had been authorized to be constructed prior to the passage of these laws. Furthermore, such elevated or underground companies might sell their rights and franchises or buy others. And the right of eminent domain was expressly conferred upon such companies with the sole exception of property used for burying grounds and places of worship, and by filing bonds whose amount was to be determined by the court of common pleas of the county, such railroads might proceed with their building before the compensation for the property condemned had either been determined upon or paid. A third law passed June 19 provided that companies which by the previous law of June 7 had been authorized to build either an elevated or an underground railway were now authorized to build either an elevated or an underground railway, or both an elevated and an underground railway. On June 20, after a large number of valuable railway charters had been granted by the secretary of state in accordance with the provisions of the previous acts noted above, a further act was approved, declaring that no further charters for elevated or underground railways should be granted unless the proposed route was through thickly populated regions and unless the application for the charter was approved by a board consisting of the governor, the secretary, and the attorney-general. Finally, two further railroad acts were passed as follows: One of them authorized any railroad corporation owning two-thirds of the capital stock of another railroad corporation, and where the two railroads connected, to acquire the rights, franchises, and property of the other railroad at a price to be fixed by the directors of the two railroads acting jointly. The other act purported to enforce the provisions of section 4, article 17, of the constitution and stated in effect that no railroad or canal shall consolidate its stock or property with a competing or parallel line, or own or have control of such parallel or competing line, except where one railroad owned a majority of the stock of the other before the present constitution went into effect, or "where a railroad corporation has furthered or shall further the construction of a line, parallel and competing with its own, by subscribing to a majority of the stock of a corporation organized for that purpose."

The precise intent of these various exhaustive railway laws has probably not been made public. But in general it was alleged by the opponents of the so-called Republican machine in Pennsylvania that the laws amounted to nothing more than a gigantic steal for the purpose of filling the purses of the machine's individual members. In fact, the entire press denounced the action of the Pennsylvania legislature and the Republican machine was individually and collectively assailed with an unequaled boldness and ferocity, and up to the utmost limits of the libel law, if not beyond its exculpating clauses. The machine consisted, mainly, as alleged, of Messrs. Matthew S. Quay, Senator; William A. Stone, governor; John P. Elkin, attorney-general; P. A. B. Widener, a friend of Mr. Elkin, and street railway magnate; Samuel H. Ashbridge, mayor of Philadelphia, their followers and adherents, and also, so far as railroad interests were concerned, the Pennsylvania Railroad Company. The bills that became law on June 7 were introduced on May 9, were passed with great rapidity through the committees of the Senate and House, and were signed by the governor on June 7, in the night. In Philadelphia, which was the principal city affected, fourteen rapid transit ordinances were introduced in the councils on June 12, giving that consent of the "local authorities" to charters given out at Harrisburg that were required under the law. These ordinances gave to Representative Robert H. Foerderer and others the right to build some 120 miles of track in Philadelphia, and they were signed by Mayor Ashbridge on the night of June 13. They were given freely and without cost, notwithstanding two remarkable offers of compensation to the city in return for the same franchises made by two private citizens not in the Republican machine. One was that of Mr. Albert L. Johnson to give 3 cent fares on all the roads in the city and also free franchises. Both of these offers were voted down by the councils, as were also various proposed amendments to the ordinances as passed, providing for municipal oversight of the roads, municipal profit sharing, and the regulations of shares. The second offer was that of Mr. John Wanamaker, who offered to pay the city \$2,500,000 cash for the privileges and franchises granted under the ordinances, although Mr. Wanamaker added, this amount was, he believed, far below the actual value of the franchises. Later, Mr. Wanamaker renewed his proposal to the city and offered in addition to give Mr. Robert H. Foerderer and others a half-million dollars for their personal use if they would transfer the franchises to him. In commenting upon the whole transaction, the *Journal of Commerce*, perhaps the most accredited representative of capital in the country, said that the laws and the franchises granted under them showed the most profound disregard of the public interests "to be found in the gloomy record of municipal mismanagement in the United States."

Charters for Cities of a Second Class.—By an act approved March 7, the existing charters for cities of the second class were destroyed and new charters were put into force. The main changes made by the new charters were as follows: The office of mayor was abolished and the executive power was vested in a city recorder, to be elected for three years and to be ineligible for election for the next succeeding term. The city recorder might remove any heads of departments appointed by him, might veto any item or items in an appropriation bill, and might, whenever he deemed it proper, appoint officers to examine the finances and accounts of any city department. The administrative functions of the city government are to be divided into the following departments: (1) Public safety, (2) public works, (3) collector of delinquent taxes, (4) assessors, (5) city treasurer, (6) city comptroller, (7) law, (8) charities and correction, (9) sinking fund commission. The city recorder may appoint with the consent of the select council and the director of public safety, the director of public works, the collector of delinquent taxes, city solicitor, the director of the departments of charity and correction, members of the sinking fund, the board of assessors, and the city treasurer. The city comptroller alone is to be an elective officer. The directors or chief officers of departments are given authority to appoint and remove all their subordinate officers, clerks or employees; the removals to be made for any cause except one that is political. For an account of the actual working of this law see article MUNICIPAL GOVERNMENT.

Corporation Laws.—Among corporation laws passed by the legislature were the following: An act relating to savings banks provided that no director of any banking institution, trust company, or savings institution should borrow from the institution of which he was director more than 10 per cent. of the paid-up capital and surplus; and the gross amount lent by such institution to its officers and directors should not exceed 25 per cent. of the capital stock and surplus. Nor should such institution take its capital stock as security for money lent, nor should it purchase and retain its capital stock except where the security taken for a *bona fide* loan was found to be insufficient. An act concerning telephone companies permitted any such company to buy the capital stock of any other and to acquire its franchises and property for the purpose of connecting the two into a continuous line; provided, however, that this should not apply to competing telephone lines. All corporations were

authorized to increase or diminish the par value of their shares of capital stock. Banking and trust companies were exempted from the benefit of a law of 1899, permitting business partners to limit their respective liabilities to the amount of the capital subscribed by each partner to the business. Municipal corporations in cities of the first and second class were authorized to permit railroads, on conditions to be prescribed by the cities, to use and occupy parks.

Labor Laws.—A factory law provides that no minor and no woman shall work in a manufacturing or mercantile establishment more than 12 hours in any day or 60 hours in a week. No child under 13 can work at all in such an establishment, and none under 16 without the consent of the parents. The manufacture of oleo-margarine, butterine, and similar products is prohibited when colored in imitation of yellow butter. A mining act provides that orders, coupons, and other symbols of indebtedness issued by mining companies to their employees and not redeemed in cash within 30 days shall be taxed 25 per cent. of their face value.

Other Laws.—The commutation or reduction of sentence allowed to convicts for good behavior in prison is increased. It was said that there was no public demand for further leniency in this matter, and that the law was for the benefit of a few chosen criminals. An act approved June 7 provides that in cities of the second and third class in boroughs in which there are not free libraries, the question of establishing such a library and of instituting a tax of not more than two mills per dollar of assessable property, must be put to vote at the annual elections in February upon petition of 3 per cent. of the voters. On petition of 5 per cent. of the voters, the further question must be put as to whether a bonded indebtedness should be included for library grounds and buildings. An act was passed for the registration of labels, trade marks, forms of advertising, etc., to protect and secure the rights of persons adopting and registering these. Another law provides that in every city of the first or second class a house of detention is to be established for delinquent, untried juvenile offenders and for neglected and dependent children under 16. An act whose intent was to legitimize illegitimate children as to the mother and her heirs, but not as to the father and his heirs, provides that illegitimate children shall take and be known by the name of their mother, each illegitimate child being considered as the half blood to each and every other child of such mother, legitimate or illegitimate, save and except where such illegitimate child shall be legitimated as to their father by subsequent marriage. The mother and her heirs and the illegitimate child and its heirs shall be mutually liable and shall have capacity to take and inherit from each other, subject to the distinction of half bloods, as if such child or children had been born in lawful wedlock. A public school law provides that in public schools of the first and second class physical culture by a regular and progressive course of calisthenics must be taught. A bill was passed establishing a fifth common pleas court in Philadelphia. It was alleged that there was no need for a new court and that the only object was to saddle Philadelphia with expenses to the amount of \$60,000 and upwards annually for the sake of various machine politicians. The vote was put through, it was said, after considerable trouble, on the assurance that one of the three new judges to be appointed should be a Democrat. An act to regulate the control and treatment of dependent, neglected, and delinquent children under 16, provides for the establishment of juvenile courts, the appointment of probation officers, and prohibits the commitment to the jail or a police station of a child under 14. A mining law provides for regulating the weight of all black blasting powder used in kegs for the coal mines and provides also for the proper certifying of the quality and quantity of the powder in the kegs. Criminal prosecution for libel shall not stand where the object was a public officer or candidate and the statements were not maliciously or negligently made, nor shall civil suits lie if the publication was found to have been substantially true and was prepared for public information. In all such cases, the truth may be given in evidence to the jury. Many of the appropriations made by the legislature to State charitable and educational institutions were cut down by the governor on the ground of insufficient revenues in the State treasury.

Constitutional Amendments.—Several amendments to the constitution were proposed by the legislature, and were voted upon affirmatively at the election in November. These amendments were as follows: First, to modify that provision of the constitution which prohibits the legislature from passing special or local laws, by sanctioning the passage of such laws providing that they have been approved at a popular election in the locality to be affected. Second, that to the article of the constitution prescribing that "every male citizen over 21 years of age" possessing the necessary qualifications shall be entitled to vote, shall be added the qualification "subject, however, to such laws requiring and regulating the registration of electors as the general assembly may enact." Third, to strike out the clause providing that "no elector shall be deprived of the privilege of voting by reason of his name's not being registered," and insert instead "laws regulating and requiring the registration of voters may be enacted to apply to cities only, provided that such laws be uniform

for cities of the same class." The effect of this proposed amendment would be to nullify the provisions of the existing constitution which enacts that "the registration of electors shall be uniform throughout the State." Fourth, to strike out that section of the constitution which provides that all elections shall be by ballot, and that every ballot shall be numbered and recorded; that any elector may write his name upon a ballot and have his signature attested; and that election officers shall be sworn not to reveal how any elector voted except in judicial proceedings, and to insert in lieu thereof "all elections by the citizens shall be by ballot, or by such other method as may be prescribed by law; provided that secrecy in voting shall be preserved."

Senatorial Election.—On January 15, Matthew S. Quay was elected Senator from Pennsylvania for the term ending March 4, 1905. Two years previously the legislature of Pennsylvania had adjourned deadlocked, and a commission was made out for Mr. Quay by Governor Stone on the ground that a vacancy had "happened" during the recess of the legislature. The Senate on April 24, 1900, taking the same view of the constitutional provisions regarding the election of Senators that Mr. Quay himself had taken previously when voting upon the merits of an applicant other than himself, declined to seat Mr. Quay, by a vote of 33 to 32. Mr. Quay thereupon set out to reorganize the State legislature on his ballot; but in this he was unsuccessful and the legislature which met on January 1, 1901, contained a majority pledged to his defeat. By January 15, however, seven men were found willing to vote for Mr. Quay who had previously agreed over their signatures to vote against him, and Mr. Quay was elected.

Democratic Convention.—The Democratic State Convention met at Harrisburg on August 15, and nominated Judge Harman Yerkes, of Doylestown, for judge of the Supreme Court, and State Representative Andrew J. Palm, of Meadville, for State treasurer. The platform adopted was confined entirely to State affairs, no reference being made to William J. Bryan, free-silver, imperialism, or other national issues. All honest citizens, regardless of party affiliations, were asked to aid in the Democratic campaign, whose sole object was to insure a decent administration, and to rescue the State from the thieves who were looting it. The last legislature, the platform declared, was agreed by all men to be "the most corrupt legislative body that ever convened in any State of the nation." That Republican legislature, constituted, organized, and operated by the open purchase and barter of votes, had violated constitutional restraints, elected a United States Senator in a carnival of bribery, apportioned appropriations to public charities by the measure of their service to the machine, overturned established municipal governments, and had finally, in a steal netting millions, plundered the railway franchises of every city, town, and township of the commonwealth. The punishment of the Democratic legislators who had assisted in these outrages was left to their constituencies; the convention denouncing the legislators as having betrayed the electors and inflicted irreparable injury on the party.

Republican Convention.—The Republican State Convention of Pennsylvania met at Harrisburg on August 21, and nominated Judge William P. Potter, of Pittsburg, formerly a law partner of Governor Stone, for Supreme Court judge, and Frank G. Harris, of Clearfield, a State representative, associated with the Quay party, for State treasurer. The platform adopted heartily indorsed the acts and policy of the national administration, both domestic and foreign, and pointed out that the State Democratic party, being unable to appeal to the people on a single national issue, had been obliged to confine itself entirely to State issues. These issues, as outlined by the Democrats, the Republicans looked at more with amusement than concern, because dissatisfied Republicans and "yellow journals" had cooperated with the Democrats to trump them up. "We arraign the Democratic party," said the Republican platform, "as incompetent, insincere, and untrustworthy." "We condemn it in the administration of our State affairs, as much as in the incompetency shown in its administration of our national affairs." "When the Democracy went out of power in our State, it left to the Republican party a legacy of almost forty million dollars of debt." This debt has been almost paid. The Republicans have further increased the appropriations to common schools and to eleemosynary institutions. The seven millions of people in the State are prosperous, "industrious, honest, law-abiding, and happy." Nevertheless "the old historic party of obstruction and negation sets up a hysterical cry of false pretense, hypocrisy, and insincerity for the purpose of misleading the people and regaining lost power." The records of Governor Stone and Senators Quay and Penrose were indorsed by the convention, as were also the operations of the last legislature. In the matter of trusts, it was stated that "the right of trusts to make proper and legal combinations" had already been recognized by several States, that labor had a like right to organize, that a "spirit of mediation and concession" should prevail in disputes between labor and capital, and that neither labor nor capital should "resort to violence or illegal methods to redress wrongs or obtain rights."

Campaign and Elections.—Although but few offices were to be filled at the Novem-

ber elections in Pennsylvania, the principal officers elected being a State treasurer, a judge of the Supreme Court, and a district-attorney in Philadelphia, the campaign assumed unusual significance on account of the alleged corruption of the Republican party and the determined effort made by the Unionists to defeat them on the platform of "ordinary honesty in civic affairs." The Unionist party was composed of Democrats and Independents who had, contrary to public expectations, found themselves able to agree upon a Fusion ticket. In Philadelphia the so-called Donnelly-Ryan annex of the Quay party, a small but compact Democratic contingent, refused to combine with the Union or Reform party in any way. Thereupon ex-Governor Pattison on September 26 resigned membership in the Donnelly-Ryan association and organized another Democratic party pledged to unite with the Reform party. For district-attorney in Philadelphia this party nominated Mr. T. Frederick Rothermel, Jr., the Republican district-attorney, whom the Republicans had refused to renominate. In the State at large the Democratic Committee had decided in its convention held on August 15 not to cooperate with the Union party. But so strong a public sentiment arose for the union of all parties opposed to the Republican machine that the Democrats reconsidered their action and on October 8 Andrew J. Palm, the Democratic candidate for State treasurer, withdrew in favor of Elisha A. Coray, the candidate for that office on the Unionist ticket. The campaign which ensued attracted the attention of the country only in a lesser degree than did that of New York. In the elections the Unionists were defeated, though by comparatively small pluralities. How small may be judged from the fact that in the national elections of 1900 Mr. McKinley's plurality in the State was 301,173, and Philadelphia, 114,478, while in 1901 Mr. William P. Potter's plurality for Republican judge of the Supreme Court was 47,937 in the State, and 32,977 in Philadelphia. More significant than these figures, however, was the fact that outside Pittsburg and Philadelphia, the Republican strongholds, the Union ticket was uniformly victorious; and in Pittsburg, and more especially in Philadelphia, fraudulent votes were alleged to have been cast to the extent of some twenty-five or thirty thousand. The possibility of such frauds resulted from the fact that Pennsylvania has hitherto had no registration law. The principal candidates for elections and the vote cast for them were as follows: For State treasurer, Frank G. Harris (Republican) received 423,498 votes from his party and 11,542 from the Public Opinion party; Elisha A. Coray (Unionist) received 291,955 votes from the Democratic party and 93,213 from the Union party. For Supreme Court judge, William P. Potter received 430,599 votes from the Republican party and 11,605 votes from the Public Opinion party; while his opponent, Harman Yerkes, received 292,410 votes from the Democratic party and 93,028 from the Union party.

State Officers.—Governor, elected for four years, term expiring January 17, 1903, William A. Stone, Republican; lieutenant-governor, John P. S. Gobin; secretary of the commonwealth, William W. Griefft; treasurer, Frank G. Harris; auditor, E. B. Hardenburgh, term three years, ending May, 1904; attorney-general, term at pleasure of the governor, John P. Elkin; superintendent public instruction, N. C. Schaeffer; insurance commissioner, appointed, Israel W. Durham; secretary of agriculture, John Hamilton; secretary of internal affairs, James W. Latta. Supreme Court—Chief justice, J. Brewster McCollum; associate justices, J. Hay Brown, James T. Mitchell, William P. Potter, John Dean, D. Newlin Fell, and S. L. Mestrezat—all Republicans except Justices McCollum and Mestrezat, who are Democrats.

Congressional Representatives (57th Congress).—In the House—Galusha A. Grow (elected at large), from Glenwood; Robert H. Foerderer (elected at large), from Philadelphia; Henry H. Bingham, from Philadelphia; Robert Adams, Jr., from Philadelphia; Henry Burk, from Philadelphia; James R. Young, from Philadelphia; Edward Morrell, from Philadelphia; Thomas S. Butler, from West Chester; Irving P. Wanger, from Norristown; Howard Mutchler, from Easton; Henry D. Green, from Reading; H. Burd Cassel, from Marietta; William Connell, from Scranton; Henry W. Palmer, from Wilkesbarre; George R. Patterson, from Ashland; Martin E. Olmstead, from Harrisburg; Charles F. Wright, from Susquehanna; Elias Deemer, from Williamsport; Rufus K. Polk, from Danville; Thaddeus M. Mahon, from Chambersburg; Robert J. Lewis, from York; Alvin Evans, from Ebensburg; Summers M. Jack, from Indiana; John Dalzell, from Pittsburg; William H. Graham, from Allegheny; Ernest F. Acheson, from Washington; Joseph B. Showalter, from Chicora; Arthur A. Bates, from Meadville; Joseph C. Sibley, from Franklin, and James K. P. Hall, from Ridgway—all Republicans except Howard Mutchler, Henry D. Green, Rufus K. Polk, and James K. P. Hall, Democrats. In the Senate—Boise Penrose (until 1903), from Philadelphia, and Matthew S. Quay (until 1905), from Beaver—both Republicans.

PENNSYLVANIA, UNIVERSITY OF, Philadelphia, Pa. Founded as a charitable school in 1740, chartered as an academy in 1753, and as a college in 1755. The number of professors, lecturers, and instructors for the academic year 1900-01 was 265, and the number of students 2,573. The students were distributed

as follows: The college, 1,006; department of philosophy, 168; law, 347; medicine, 566; laboratory of hygiene, 18; dentistry, 417; veterinary medicine, 60. Of this number, 1,787 were from Pennsylvania. The year 1901 has seen the completion of the new Randal Morgan Laboratory of Physics, the Memorial Tower, and additional dormitories, and also a large addition to the equipment of the department of geology and mineralogy. A beginning in the direction of free electives has been made in the college in the reorganization of the courses in arts and science, finance and economics, and biology. The change is a somewhat radical one for Pennsylvania. The plan, when worked out in detail, will involve an extension of the elective system and the possibility to a student of taking three, four, or five years for his college course, or beginning his professional course a year earlier by including professional subjects in his undergraduate work. The matter seems to be in the experimental stage as yet. To meet the rapidly increasing needs of the law department and the department of veterinary medicine the trustees have purchased additional two adjoining tracts of land for future buildings. The increase in the library for the academic year was about 11,800, and 2,916 volumes were added to the law library. The two libraries now contain about 200,000 volumes and about 50,000 additional pamphlets. The total income of the university for the academic year ending September 1, 1901, was \$477,836.16. The total contributions received by the present administration amount to \$3,813,310.15. The treasurer's reappraisal of the property of the university makes an aggregate value of about \$10,000,000.

PENSIONS. The report of the commissioner of pensions for the year ending June 30, 1901, shows a total enrollment of 997,735 pensioners, an increase over the preceding year of 4,206. During the year there were added to the rolls 44,225 new pensioners, and 3,567 were restored to the rolls, making a total addition of 47,792 names. The number of pensioners dropped from the rolls during the same period was 43,586. The annual value of the army pension roll, exclusive of all expenses for the maintenance of the bureau, was \$131,586,216 on June 30, 1901, as against \$131,534,544 the year previous. There were pending on June 30, 1901, 403,569 claims of all classes. Of these 33,532 were claims on account of the war with Spain, 24,206 were claims for accrued pensions due deceased pensioners, 11,798 were claims of invalids not yet adjudicated, 32,520 were claims filed again after having been rejected, 41,399 were claims for "new disabilities," and 228,534 were claims for increase, re-ratings, re-issue, restoration, etc. On account of the war with Spain, \$1,175,225.26 was paid for army and navy pensions during the year; for army pensions alone there was paid \$1,121,229.72, as against \$322,905.25 the year previous. Remarking upon this increase the commissioner of pensions stated that the soldier of the Spanish War enjoyed far greater benefits than had the soldier of the Civil War, and he was taking advantage of it accordingly. For the gradually-increasing pensions allowed by Congress had come fully to the Civil War veterans only a generation after the war was concluded, but to the Spanish War veterans they came at once. Moreover, while the average time of service in the Civil War was two or three years, it was not more than six months in the Spanish War. And the result of the greater liberality of the government is this: "Only a little over three years have passed since the hostilities began, and yet claims amounting in number to about 20 per cent. of the number of men enlisted for the Spanish War have already been filed; while with four years of the most terrible war—1861-65—and at the close of the fiscal year 1872, seven years thereafter, Commissioner Baker reported that only about 6 per cent. of the soldiers had filed claims." At the first session of the 56th Congress special pension acts were passed whose monthly value was \$9,813.25, and at the second session pension acts whose monthly value was \$10,016. On June 30, 1901, there were on the rolls four widows of the Revolutionary War, and five daughters pensioned by special act. There was also one surviving soldier of the War of 1812, Hiram Cronk, of Oneida County, N. Y., who was 101 years old. The total amount paid for pensions during the year ending June 30, 1901, including arrears of pensions, was \$138,531,483.84. The following table shows the disbursements for pensions and for expenses connected with the maintenance of the Pension Bureau for the fiscal years 1899, 1900, and 1901, and also shows the total disbursements for pensions since 1790. It will be noted that the total pension payments from 1790 to 1865 aggregate but little more than two-thirds of the sum which is at present paid out yearly.

	Disbursements for Army and Navy Pensions.	Expenses Connected with the Pension Bureau.	Total.
For the fiscal year of 1899.....	\$138,355,052.95	\$4,147,517.73	\$142,502,570.68
For the fiscal year of 1900.....	138,462,130.65	3,841,706.74	142,303,837.39
For the fiscal year of 1901.....	138,531,483.84	3,868,795.44	142,400,279.28
From July 1, 1790, to June 30, 1865.	96,445,444.23	.....	96,445,444.23
From July 1, 1865, to June 30, 1901.	2,666,904,589.23	*93,823,338.96	2,760,727,928.19
From July 1, 1790, to June 30, 1901.	2,763,350,033.46	.....	2,857,173,372.42

*Approximate—too low.

Fraud in Obtaining Pensions.—The commissioner of pensions stated, as has almost every preceding commissioner since the Civil War, and as was alleged in many magazine articles written during 1901, that fraud on a large scale in obtaining pensions cannot be checked, and is not checked under the pension laws established by Congress. These laws, maintained in force, notwithstanding positive evidence of hundreds if not thousands of frauds committed every year, direct the Pension Bureau to grant pensions on *ex parte* evidence only, and authorize no machinery whereby the Pension Bureau may obtain countervailing evidence. If an applicant for a pension presents an affidavit, with the signature of witnesses, showing him to be a person, hitherto unpensioned, who has enlisted in the armies of the United States; and if he in addition presents the certificate of a local medical board, appointed usually at the instance of politicians and at the initiative of interested persons in the community, showing him to be invalided, the applicant is *de facto* entitled to a pension. That the witnesses may be mythical, or kind-hearted at the expense of veracity and the government funds, has been proved again and again; that the local medical board is likely to be either ignorant, or corrupt, or unwilling to prejudice itself in the community in which its individual members practice, is shown among other things by the unheard-of prevalence of certain diseases in certain localities, and the abrupt substitution of one disease for another upon the appointment of another medical board. Thus an entire community of prospective pensioners may be successively smitten with organic heart disease; while five years later chronic dysentery may be even more epidemic within the radius of the board's examinations. The great majority of these frauds the Pension Bureau was unable to detect, though it did object to paying a pension to a "totally deaf" man employed in a telephone exchange, a "totally blind" man working in a jewelry store, and a "totally disabled" man found at the top of a twenty-foot ladder painting a house. To correct such obvious and recurrent frauds, the commissioner earnestly recommended that traveling boards be authorized, consisting each of an attorney and a medical examiner and their assistants, and to be under the direct jurisdiction and control of the Pension Bureau and unamenable to local influence. As no insurance company would be expected to pay out great sums without satisfying itself of the validity of the claims presented, so, as alleged by the Pension Bureau, the government should be allowed to see that claims were at least probably correct. Moreover, the establishing, rather than as at present the indiscriminate granting, of claims would operate to the advantage of every honest claimant; would shorten the time during which claims were "hung up," and would make the granting of a pension an actual instead of a very doubtful honor. That in a large majority of cases attorneys and solicitors, and not claimants, were responsible for fraudulent claims, the commissioner of pensions readily admitted. While many pension attorneys were honorable, many were not, and the business itself was more inviting to attorneys of the lower grade. These attorneys sought out possible pensioners, persuaded them that it was proper to defraud the government, and understanding thoroughly the government's frail line of defense, easily concocted the necessary affidavits and persuaded the claimants to sign them. In the case of ex-soldiers, these frauds were prevalent and expensive enough; but the case of widows was a much worse one, both because a fraud could here be more easily established and because an act of Congress had made the rewards of fraud much greater. This act, passed in 1888, provided that widows' pensions, no matter when granted, should date from the death of the husband; and the result of it was, that as soon as a pension attorney could find the name of an obscure soldier, never pensioned, and remembrance of whom had been obliterated in the thirty-five years since the Civil War, a widow and witnesses of her widowhood and of her husband's death could be hired without difficulty, and a pension acting retroactively through all the years would be granted. The law was stated by the commissioner to be thoroughly vicious, a direct incentive to fraud, and he advocated its repeal.

PENSIONS FOR WORKINGMEN. Dr. S. M. Lindsay, in his report to the Industrial Commission on Railway Labor in the United States (see **INDUSTRIAL COMMISSION** and **POLITICAL ECONOMY**) gives an extended description of the pension features of American railway management. This method of relief, although quite general in Europe, has only of late years been adopted by American railways, and at the present time the Pennsylvania, Chicago, Milwaukee and St. Paul, Atchison, Topeka and Santa Fé, Baltimore and Ohio, Chicago and Northwestern, and Illinois Central railroads have put in operation plans of superannuating their employees on pensions graded according to their rank and length of service. The Pennsylvania Railroad retires (1) all officers and employees who have attained the age of 70 years; (2) all officers and employees, 65 to 69 years of age, who have been 30 or more years in the service and shall have become physically incapacitated. The pension allowances are determined as follows: "For each year of service one per cent. of the average monthly pay for the 10 years preceding retirement. . . . If, for example, an employee has been in the service of the company steadily for 41 years and during

that time has been out of service for periods amounting to one year, and if his average wages for the past 10 years were \$40 per month; then upon retirement now he would receive 40 per cent. of \$40, or \$16 per month as his pension allowance." The provisions of the Baltimore and Ohio and the Chicago and Northwestern railroads are in general similar to that of the Pennsylvania. On July 1, 1901, the Illinois Central Railroad Company put into operation a pension system for their 40,000 employees, which is unusually liberal in its provisions. A sinking fund of \$250,000 is set apart to meet the expenses of the fund with \$100,000 yearly appropriation added. This is \$50,000 larger than the maximum limit of the Pennsylvania's pension disbursements. On retirement the pensioner is to be given one per cent. of the average monthly pay for the last 10 years of service for every year he has been in the employ of the company. If his average monthly pay has been \$50 for the last 10 years, and his term of service is 40 years, he will receive 40 per cent. of \$50, or \$20 per month. Once on the pension list, the employee gets monthly remittances. All employees doing outdoor work in the operating department may be retired on pension on reaching the age of 65 years, providing they have been in the service of the company for 10 years. All officers and employees in every department will be retired at 70 years of age and pensioned if they have been in the service of the company for 10 years. Officers and employees between the ages of 61 and 70 who are incapacitated may also be retired and pensioned.

Systems of accident insurance have also been put in force on many American railroads during recent years. This policy is being extended to manufacturing corporations. The most striking benefaction of this character during 1901 was the establishment by Mr. Andrew Carnegie of a trust fund of \$4,000,000, the income from which is to be employed as a fund from which relief may be given to those employees of the Carnegie company who may be disabled by accident, and the dependent survivors of those killed, and also for the pensioning of those employees who by long and faithful service have earned a place upon the benefit roll. It is stipulated in the deed of gift that this fund shall not do away with the relief which the company has always given in such cases. Mr. Carnegie, at the time of making this gift, stated that the plan adopted was not as good as a pension and benefit system to which the employees could themselves contribute, and the trustees of the new pension fund are authorized to make the \$4,000,000 the basis of such a system, in case it shall ever be devised. In foreign countries the ideas of pensions and insurance against accident continue to make rapid headway. The accident insurance law recently passed by the government of Holland provides that if an injured employee is unable to resume work on the third day after the accident, he receives 70 per cent. of his earnings as long as he is unable to work, up to six weeks. At the end of that time, if still unable to work, the same stipend continues if the employee shall be found to be totally disabled, and if only partially disabled, the amount decreases with his incapacity. Earnings of more than \$1.60 a day are left out of account in calculating these allowances. In case of death, the relatives receive a burial allowance equal to 30 times the wages of the deceased workman. Dependent relatives receive in addition, pensions varying from 15 to 30 per cent., but not exceeding 60 per cent. of the daily earnings. Widows, if they remarry, and children, on reaching the age of 16, receive a sum in commutation of future pension payments. The entire cost of the insurance is borne by the employer, who is, moreover, forbidden to make any deduction from wages on account of pension payments. This is paralleled by the French workman's compensation bill, which provides that at the age of 55 any workman can demand a pension based on payments made by himself and his employer, and also, that if permanently disabled while under the age of 55 he can claim a pension supplemented by a bonus from the state, providing his payments amount to 2,000 days' work.

Opinion of the merits of such schemes of insurance is divided. Says the *Iron Age*, of the Carnegie pension fund: "A great deal depends upon the wisdom with which the trust is administered. It could be made a source of annoyance to the company and of injury to the men, if so used as to encourage the willing dependents and pauperize those infirm of purpose or inclined by temperament to rely upon others rather than upon themselves. This is not likely to happen in the case of the Carnegie fund. It is in the hands of very practical people who have not shown any tendency to lapse into sentimental altruism. Assuming, as we safely may, that it will be wisely and discreetly administered, it will undoubtedly do a great deal of good, and relieve much suffering without inflicting upon beneficiaries the humiliation of charity. As a rule, the pensioner is proud of his pension, whether it has been earned in military, civil, or corporate service. It is a credential of good character and meritorious discharge of duty. It is the one and only way in which the workman may receive a benefit for which a just equivalent is not exacted, without harm to himself." On the other side, the *Chicago Public*, a radical organ, severely condemns the system: "Every employee who receives such pecuniary benefits either

earns them or gets them as a charity dole. . . . But if he earns them he ought to be able to get them as a right, and not as a privilege under an employer's patronage. If he does not earn them, then he is the petty beneficiary of a degrading charity system. In our view every man who works earns more than his wages plus all the altruistic benefits he receives, and though we offer no condemnation of charitable intervention while workers are plundered to the extent of impoverishment, we do not hesitate to denounce devices which, in the guise of charity or the name of altruism, serve to deaden the public conscience while universal robbery through special privilege is perpetrated."

The recent experience in Australia seems also to condemn the policy of making temporary provision for the granting of old-age pensions, which went into effect in Victoria on January 1, 1901. The sum of £75,000 was provided, which the government thought would be sufficient for the half year. Before the time expired, however, the appropriation was exhausted by the claims. The *Charity Review* of Melbourne states that the immediate effect of the act has been to pauperize many of the recipients. It continues: "However, for good or ill, the step has been taken, and such steps cannot be retraced. We must go forward; the tendency will be to increase the area over which the pensions are spread and we may eventually arrive at the Universal Old Age Pension advocated by Charles Booth and other English authorities. In any case, certain subsidiary legislation is already strongly indicated as highly desirable, if not absolutely necessary, especially in the following instances: Adults should (as in Canada is already the law) be compelled to support their aged parents unless sufficient cause be shown to the contrary. An inebriates' asylum act should be passed and provision made for the support of the inmates, either by their own labor, by any pension they may be entitled to, or by their children or other near relations." The necessity of the second provision is shown by the claim prominently put forward in Victoria that the pensions would eventually mean a big government bonus to the saloons. See VICTORIA.

PERRY, WILLIAM FLAKE, Confederate brigadier-general, died at Bowling Green, Ky., December 18, 1901. He was born in Jackson County, Ga., March 12, 1823, and was educated at Brownwood Academy. After teaching for six years, he was in 1854 chosen to organize the educational system of Alabama. At the outbreak of the Civil War he joined the Confederate army, and rose in rank to brigadier-general. While in command of a regiment he was engaged in the battles of Chickamauga, the Wilderness, Spottsylvania, and Cold Harbor, and in the operations at Petersburg and Appomattox. From 1883 he was professor of English and philosophy at Ogden College, Bowling Green, Ky.

PERSEUS, NEW STAR IN. See ASTRONOMICAL PROGRESS.

PERSIA, an independent Asiatic monarchy extending from the Caspian Sea to the Gulf of Oman. The capital is Teheran.

Area, Population, etc.—The estimated area is 628,000 square miles and the estimated population between 9,000,000 and 9,500,000. Not more than 1,000 of the inhabitants are Europeans. Teheran has about 250,000 inhabitants; Tabriz, 180,000; and Ispahan, 80,000. Nearly 90 per cent. of the people belong to the Shah sect of the Mohammedans. There are a number of schools receiving state aid, but education is in a backward condition. A writer stated in 1901 that there are few schools in Persia "save here and there chattering groups around a village priest, or worse than mediæval groups around a mesjid and a mujtahid." The condition of the prisons is said to be wretched, while the courts are "half civil, half ecclesiastical, irregular, and with no written codes, no jury system, no pleading, no testimony save the eloquence and evidence of bribes."

Government and Finance.—The shah, or king, is an absolute monarch so far as his rulings do not conflict with the principles of the Koran. The present shah is Muzaffar-ed-din, who ascended the throne May 1, 1896. The grand vizier since August 11, 1898, has been Mirza Ali Asghar Khan. The army is stated to number 105,500 men, but the regular or standing army does not exceed 24,500.

The monetary standard is silver, and the unit of value the kran, worth 7.9 cents on October 1, 1901. About 15 per cent. of the revenue is derived from customs and the remainder from posts, telegraphs, government concessions, etc. All the customs are leased. For the fiscal year 1900 the revenue was estimated at less than \$7,300,000. Financially the government is under Russian influence.

Industry and Commerce.—Agriculture is carried on to some extent, and cereals, gums, cotton, sugar, opium, and tobacco are produced. Persia possesses valuable mineral resources, including petroleum, coal, iron, copper, argentiferous lead, and other minerals; some of these are worked in primitive fashion by the natives, but actual development awaits the introduction of better transport facilities. The most important manufactures are silk and carpets. The principal imports are cotton and woollen goods, provisions, hardware, etc.; and the leading exports are cotton, wool,

tobacco, opium, dried fruits, silk, and carpets. In 1899 the share of British shipping in the trade of the southern ports amounted to 82.2 per cent. In the same year the value of the imports at these ports amounted to £2,276,157, of which the imports from India were represented by £1,053,242, and those from Great Britain by £602,308. The exports from these ports amounted to £1,342,849, of which India received £487,589, and Great Britain £94,430. The aggregate value of the imports and exports for the fiscal year ending March 21, 1901, was reported to be about £8,000,000, exclusive of some £800,000 representing the greater part of the pearl trade and the trade across the Kurdistan and Baluchistan frontiers and through Mohammerah, where the customs system has not yet been established. Of the £8,000,000, 56 per cent. represent Russian trade, 24 per cent. British, 6 per cent. Turkish, 5½ per cent. French, 4 per cent. Chinese and Japanese, 2½ per cent. Austrian, and ½ per cent. German.

The trade of northern Persia is largely in the hands of Russians, while that of the southern part of the country is controlled chiefly by Indian merchants (British subjects). Russian steamships touch at Enzeli, a town on the Caspian, about 20 miles from Resht. The Russians in 1899 completed a wagon road from Enzeli through Resht to Kazvin, and a wagon road, 200 miles in length, constructed with Russian capital, has been opened from Resht to Teheran. These roads constitute the principal commercial routes in northern Persia; but the old route from Trebizond, on the Black Sea, passing through the important province of Azerbaijan, is still used to some extent. Trade in the Persian Gulf is carried on by British steamships from Bander Abbas to Basra. From Bander Abbas in Laristan and Bushire in Farsistan, important caravan routes lead to the interior. Since transportation by caravan is very expensive, the English are attempting to utilize the Chat-el-Arab (the union of the Tigris and Euphrates) and its affluent, the Karoun; the latter is navigable as far as Ahwaz, about 100 miles from its mouth. From that town a caravan road to Ispahan, the winter residence of the Shah, was opened in 1900.

Communications.—Transportation is effected chiefly by pack mules and camels. There are only six miles of railway in operation, from Teheran to Shah-Abdul-azim. Besides those mentioned in the preceding paragraph, the only wagon roads in the country are from Teheran to Kom and from Teheran to Kazvin, each about 90 miles in length. In September, 1901, it was semi-officially announced that work had been begun at several points on the proposed Russo-Persian railway; this line is projected to connect Tabriz, in Azerbaijan, with Hamadan (a branch line extending thence to Teheran) and Julfa, a suburb of Ispahan, and it may be carried as far as Bander Abbas. It was announced in the fall of 1901 that the construction of a railway under Russian auspices would be at once begun, to connect the Russian trans-Caspian line at Askabad with the Persian province of Khorasan at Meshed.

There are about 4,800 miles of telegraph line. In 1901 the Persian and British governments agreed upon the construction by the latter of a three-wire telegraph line from Kashan to Jask, the line running by way of Kirman and Bampur. From Jask telegraphic communication has hitherto been continued by cable up the Persian Gulf. The purpose of the new line, besides facilitating communication with south-eastern Persia, is to make the Indo-European system independent of the Gulf cable.

History.—In February, 1901, a Russian line of steamers was established between Odessa and the Persian Gulf. Hitherto Great Britain has controlled the trade of southern Persia, and Russia will be at a serious disadvantage, not only on this account, but because Russian goods are generally inferior to British. Moreover, since Persia produces little that is needed in Russia, the return cargoes will be small. Recognizing these facts Russia has subsidized the new line. The steamers carry to Persia chiefly sugar, cotton goods, and petroleum.

In her search for an ice-free port, Russia has not been unmindful of the possibilities of the Persian Gulf, and for two years or more it has appeared that she has been gradually absorbing Persia by various means, direct and indirect, including loans and railway concessions, and more recently by the appointment of consuls to most of the large Persian cities and the establishment of a subsidized steamship line, mentioned above. There are Russian consuls at Bushire, Basra, and Bagdad (in Turkish territory), there is a Russian cruiser in the Gulf, and in 1901 a Russian "botanical zoological" expedition made a thorough survey for the proposed Russian line of railway from Meshed to Bander Abbas. With regard to the growth of Russian influence at the expense of British, the position was held in some quarters in 1901 that since Great Britain's interest in Persia is commercial and not, as Russia's may be, both commercial and political, any attempt to forbid Russia access to the Persian Gulf would be "to play the dog-in-the-manger;" an obstructive course on the part of Great Britain, it was held, would be inconsistent, since there seemed to be acquiescence, on the part of the British government, in the German scheme of reaching the Gulf by the Bagdad railway.

On the other hand, arguments were brought forward to show that Great Britain,



. H J K L M N O P Q

R

Living Street



for commercial, and especially for political reasons, should not, without protest, surrender her present influence in southern Persia. Russia, it was held, was not striving for an outlet at Bander Abbas or Chahbar so much for commercial purposes as for the strategic value which such a position would give here. It was pointed out that the construction of a proposed Russian railway from the trans-Caspian line to the coast would not be a paying enterprise, since the exports would necessarily be small and since imports are discouraged by the Russian government. Such a line across Persia, moreover, would pass through large districts of desolate and even desert country, which would be exceedingly prejudicial to its commercial value. What Russia was aiming at, in the opinion of certain pro-British writers, was the establishment of a "Port Arthur" on the Persian coast. The acquisition of such a position obviously would affect the connection of Great Britain with India. In the opinion of Captain Alfred T. Mahan, the American expert on naval strategy, it would "entail a perpetual menace of war;" while, according to Colonel Mark S. Bell, the well-known British military authority, it would "envelop Afghanistan, threaten India's flank, and menace the main arteries of communication which lead not only to India, but to Australia and the far East as well." General Collen, who was lately secretary in the military department of the government of India, said that it "would be in the highest degree imprudent to rely on the pacific disposition of a particular monarch, or even on a friendly understanding with a great military Asiatic power, were this to be our only security." And it was further maintained that with a Russian railway connecting the trans-Caspian line with a Russian naval base on the Persian Gulf the government of India "would have to fortify their frontiers more, not less; to construct more, not fewer strategic railways; and to increase, not decrease their army and fleet in Indian waters." The desire on the part of some Englishmen to reach some kind of a *rapprochement* with Russia, and especially an amicable understanding in regard to the Persian Gulf, was doubtless due in part to the violent Anglophobia existing in Germany in 1901. But, on the other hand, the surrender of British influence in the Gulf, acquired after "a century of effort," was no small matter; and the opponents of such a policy expressed a seemingly justifiable apprehension in their disapproval of extending to so wily a diplomatic power as Russia any strategic favors without receiving some tangible *quid pro quo*. For a further account of the Persian Gulf question, see ARABIA (paragraph The Troubles in Koweyt).

It was reported in October, 1901, that a plot against the life of the Shah, headed by several members of the royal family and a minister of state, had been discovered and frustrated.

PERSONALITY. SECONDARY OR MULTIPLE. See PSYCHICAL RESEARCH, SOCIETY FOR.

PERU, a republic on the Pacific coast of South America between Ecuador and Chile. The capital is Lima.

Area, Population, etc.—The area of the eighteen departments and two provinces comprising Peru has been estimated at 695,720 square miles. This includes the department of Tacna (12,590 square miles), which is ceded provisionally to Chile; the attitude of that country, however, indicates that this cession will become permanent. There are unsettled questions of boundary with Brazil, Bolivia, and Ecuador. A protocol submitting to arbitration the boundary and other disputes with Bolivia was signed in November, 1901. The population, exclusive of uncivilized Indians, was officially estimated in 1896 at 4,699,999. The Roman Catholic is the only religion having a legal status in Peru. Primary instruction is nominally compulsory, and in the municipal schools gratuitous.

Government.—The chief executive is a president, who is assisted by a cabinet, the members of which hold office at his pleasure. The president for the four-year term beginning September 8, 1899, is Señor Eduardo López de Romaña. The legislative power devolves upon a congress consisting of a senate and a house of representatives.

The regular army consists of 3,075 officers and men; the navy is inconsiderable.

Finance.—A law establishing the gold standard was promulgated October 13, 1900; this was subsequently approved by the senate, and, on December 6, 1901, by the house of representatives. The unit of value is the sol, worth one-tenth of a British sovereign, or 48.665 cents. The most important source of revenue is customs; the largest item of expenditure is for the department of finance. The estimated revenue and expenditure for the fiscal year 1898 were 10,785,850 soles and 11,488,240 soles respectively; in 1899, revenue, 13,701,370 soles, and expenditure, 12,817,910 soles; the estimates proposed for 1900 were 13,850,000 soles for revenue and 14,220,000 soles for expenditure. In 1890 the government was released from its foreign debt in consideration of extensive concessions to the bondholders, who constitute the Peruvian Corporation. The internal debt has been stated at about 48,294,000 soles. The financial situation was somewhat strained in the fall of 1901 and it was proposed to

declare gold coin the only legal unlimited tender and to demonetize 100,000 silver soles.

Industries and Commerce.—Agriculture and mining are the principal industries. The chief products include sugar, wools, cotton, coffee, and silver. The estimated sugar production for 1901 was 140,000 tons. The cotton export in 1898 was 6,712 metric tons; in 1899, 5,876 metric tons; wools in 1899, 3,435 metric tons. In the latter year the value of ores exported was about 10,667,000 soles (\$4,648,800). The exportation of petroleum has ceased; its production in 1899 amounted to 19,845,991 litres. The leading imports are cotton and woollen textiles, iron and steel goods, and food-stuffs. Imports in 1899 and 1900 were reported at 18,734,949 soles and 23,171,500 respectively.

The export trade of Peru during 1900 showed an increase of 46.4 per cent. over that of the preceding year, the exports in 1899 amounting to 30,725,911 soles (\$14,932,792), and in 1900 to 44,979,996 soles (\$21,860,278). These figures do not include the exportation of guano, and represent only the trade of the Pacific ports; the trade of the eastern river port, Iquitos, has not been officially reported; but it is estimated that if the trade from that port be added, the total exportations of Peru in 1900 would amount to about 50,000,000 soles. Great Britain still has first place in the export trade, receiving in 1900 46.49 per cent. of the total amount exported, against 50.44 per cent. in 1899; the United States ranks second, with 21 per cent. in 1900, against 4.49 per cent. in 1899; Chile third, with 13.7 per cent., against 18.54 per cent. in 1899; and Germany fourth, with 11.47 per cent., against 7.49 per cent. in 1899. The remarkable increase in the value of the exports sent to the United States was mainly represented by sugar. The greatest increase in the exports of 1900 was in minerals (especially copper), sugar, cotton, cocaine, and hides, in the order named. Especial attention is called to Peru's exports of cotton, which in 1900 amounted to 7,246 metric tons, and, since the cotton factories of Tocuyo consumed about 1,400 tons, the total cotton production may be estimated at about 8,600 tons. On the other hand, the production of wool which should be an export of increasing importance, has for a number of years practically remained stationary. The values in United States money of the leading exports in 1900 were as follows: Minerals, \$8,137,975 (exclusive of bullion and coin, gold, \$354,988, and silver, \$98,579); sugar, \$7,075,395; cotton, \$1,583,721; wools, \$1,440,732; cocaine, \$563,625; hides, \$527,594; coffee, \$307,996.

Communications.—In 1898 there were open to traffic 1,035 miles of railway, of which 844 miles were operated by the Peruvian Corporation. Since that time railway construction has progressed and new lines have been projected. The telegraph lines in 1900 aggregated 2,248 miles. Communication by way of the Amazon River is increasing in importance. The river is navigable to sea-going vessels from Pará to the Peruvian town of Iquitos, over 3,000 miles distant.

History.—In his message to congress in July, 1901, President Romaña stated that his efforts were directed to stamping out political discord, improving the national finances, which were at that time in a satisfactory condition, and strengthening foreign relations. The question of the undetermined boundaries of Bolivia, Brazil, and Ecuador, he said, had not caused any tension. In August a resolution to censure the cabinet, introduced in the house of representatives, caused much excitement in Lima. The resolution was adopted by the house and rejected by the senate. The cabinet appeared to have the approval of the people. On January 31, 1901, an extradition treaty with the United States was proclaimed. At the beginning of 1901 the Harvard University meteorological stations, which for a number of years had been maintained at various points of high altitude in Peru, were discontinued.

PETROGRAPHY. See GEOLOGY.

PETROLEUM. The production in the United States in 1900 was 63,362,704 barrels, valued at \$75,752,691, as against 57,070,850 barrels, valued at \$64,603,904, in 1899. This was the greatest production ever known, the large increase being due to West Virginia, California, Ohio, Indiana, and Texas. Of the total output 91½ per cent. was obtained from the Appalachian and the Lima-Indiana fields. The average price of petroleum in 1900 was \$1.19 per barrel, as compared with \$1.13 1-5 in 1899. There were in the Appalachian and the Lima-Indiana fields 14,583 wells, and of these 11,764 were productive. Petroleum is obtained from California, Colorado, Illinois, Indiana, Kansas, Kentucky, Indian Territory, Michigan, Missouri, New York, Ohio, Pennsylvania, Texas, West Virginia, and Wyoming, and since January, 1877, 104,793 wells have been completed in the Appalachian oil field, of which number 18,894 have failed to produce oil. Assuming the average cost of drilling each one at \$2,000, this gives us a value of \$209,586,000 spent in boring for oil. The total number of wells completed in the eastern petroleum field since the discovery of oil by Colonel Drake at Titusville, Pa., in 1859, is estimated at 118,000. The total number of gallons of petroleum and its products exported in 1900 was: 975,123,476, valued at \$73,276,282, compared with 951,024,441 gallons valued at \$64,982,249 in 1899. Although the value

Courtesy National Oil Reporter.

TEXAS OIL FIELDS.—Wells on Spindle-Top, Beaumont.

of the exports was the greatest known the quantity was slightly under that of 1898 and 1897. The exports included crude petroleum, naphtha, illuminating oil, lubricating oil, paraffine, and residuum, and were sent to Europe, Asia, Africa, Oceanica, West Indies, South America, and Central America. Perhaps the most noteworthy development of the year has been the discovery and development of the new Texas oil field at Beaumont. The oil was discovered in the beginning of 1901, and on January 10 of that year, a great well known as the Lucas gusher was suddenly struck $4\frac{1}{2}$ miles south of the above-mentioned place. It produced more petroleum in a given time than any other well thus far developed in the United States. Only a few of the Russian wells at Baku, which have larger tubes, have yielded more petroleum in the same time. The well flowed continuously in a column six inches in diameter to an average height of 160 feet until capped on January 19, 1901. For the nine days its output was 75,000 barrels per day. Since its discovery so many wells have been bored around it that there is a perfect forest of oil derricks. The wells are nearly all of them located on an elliptical mound known as Spindle Top, which is about 3,500 by 1,500 feet and rises to a height of 16 feet above the prairie. The oil was struck at a depth of 960-1,050 feet and before reaching it a number of sands and clays are passed through. The Texas oil differs from the Pennsylvania material in certain important respects. Thus, when Pennsylvania or Ohio oil is distilled there is deposited from the last distillates on cooling, a mass of crystals of paraffine wax, and the residuum in the still shows particular properties; on the other hand, the distillation of Texas or even California oil, the heavier distillates yield no paraffine wax and the residuum, which is composed essentially of asphaltum, is usually quite large.

The University of Texas Mineral Survey has been prompt in issuing a bulletin on the Beaumont oil field. Another development in 1901 is the opening up in Jasper County of a field of heavy oil entirely distinct from most other kinds found in the United States. It is of a dark color, having a gravity of 18° to 20° Beaumé, and is low in illuminants but excellently adapted for lubricating purposes. The base is asphalt similar to that of the Texas and California oils, and the material has been found to make a good flux with Trinidad asphalt. A new oil field is said to have been discovered in Persia near Talish-Doulab, on the Caspian Sea. In spite of the great supplies of petroleum known to occur in different parts of the world the extraction of oil from bituminous shales by distillation appears to be profitable in some localities. An instance of this is the Scotch shale oil industry, which still continues to thrive. It takes one ton of shale to make 42 American gallons of petroleum distillate. A plant for the extraction of shale oil is also in operation at Orepuki, New Zealand. Shale is treated in retorts and the products of distillation are caught and separated. They include sulphate of ammonia and crude oil, while the residue is coke. The United States Geological Survey has recently issued a bulletin on the Kansas, Indian Territory, and Texas oil and gas fields, by G. I. Adams.

PETROLEUM DRINKING. The alarming spread of petroleum drinking was announced by the Medical Society of Paris in March, 1901, and the desire to adopt some means to prevent its progress was expressed. The origin of the habit seems to be due to the increased taxation of alcohol. The victims of this habit are said to become morose.

PETTENKOFER, MAX VON, German scientist, died at Munich, February 10, 1901. He was born near Neuberg, Germany, December 3, 1818, and was educated at the University of Munich. In 1847 he became professor of medical chemistry at the university, and held that post for three years. His work in experimental hygiene attracted the attention of the university authorities, who founded a chair of that science at Munich in 1865 and made him first professor. He was a co-editor of the *Zeitschrift für Biologie* from 1864, and in 1883 founded the *Archiv für Hygiene*, of which he was the first editor. Professor Pettenkofer was notable as a chemist, but his importance to scientific progress consists in his foundation of hygiene as a particular study. As president of the cholera commission in 1873, he proved by his researches that the existence of the disease is due to a specific germ; that it may be spread through ground-water, depending upon climatic conditions, and that infection depends largely upon individual predisposition. In connection with his study of hygiene he pursued elaborate chemical research, one of his achievements being the discovery of a method for determining the amount of carbonic acid gas in the atmosphere. He also made important contributions to the knowledge of house ventilation and of respiration, and published many scientific monographs and books, among which may be mentioned: *Was Man gegen die Cholera thun kann* (1873); *Populäre Vorträge über Kanalisation und Abfur* (1880); and *Die Cholera von 1892 in Hamburg* (1893).

PHELPS, THOMAS STOWELL, rear-admiral U. S. N. (retired), died in New York City, January 10, 1901. He was born at Buckfield, Me., November 2, 1822, and

graduated at the Naval Academy in 1846. He was promoted to lieutenant, 1855, lieutenant-commander, 1862, commander, 1865, captain, 1871, commodore, 1879, and rear-admiral, 1882. Previous to the Civil War he was connected with the United States Coast Survey and also saw service in the Mexican War, the Indian War in Washington Territory, 1855-56, and in the Paraguay Expedition, 1858-59. After the attack on Fort Sumter he was engineering expert of the expedition sent to its relief, and served with distinction throughout the war, principally in engineering and surveying work, although he commanded vessels at Yorktown, West Point, and Fort Fisher. He was retired in 1884. Rear-Admiral Phelps wrote: *Reminiscences of Washington Territory, Sailing Directions for the Straits of Magellan*, and many historical articles.

PHILIPPINES, a group of islands lying east of Indo-China, were acquired from Spain by the United States in virtue of the Treaty of Paris, which was signed December 10, 1898, and ratified by the United States Senate February 6, 1899. The total area is perhaps 140,000 square miles, and the population about 8,000,000.

Revenues and Expenditures.—The following table shows the revenue and expenditure in the Philippines from the date of the American occupation, August 20, 1898, to June 30, 1901:

Revenues.	Fiscal Year Ending June 30—			Total.
	1899.	1900.	1901.	
Customs	\$3,097,864.15	\$5,535,952.49	\$9,032,600.70	\$17,666,417.34
Postal	42,954.87	104,282.54	121,559.26	268,796.67
Internal	240,378.27	522,509.01	932,484.91	1,695,372.19
Miscellaneous	130,131.03	361,195.58	591,017.52	1,082,344.13
Total	\$3,511,328.32	\$6,523,939.62	\$10,677,662.39	\$20,712,930.33
Expenditures.				
Customs	\$29,177.16	\$134,685.83	\$280,815.23	\$444,678.22
Postal	30,410.75	89,149.51	147,031.25	266,591.51
Other expenditures	2,337,810.80	4,994,545.78	6,335,975.20	13,668,331.78
Total	\$2,397,398.71	\$5,218,381.12	\$6,763,821.68	\$14,379,601.51

Agriculture.—The Philippine Islands constitute fundamentally an unutilized agricultural country. The great extent of fertile land, the wide variations of elevation, and consequently of temperature, may be made available for large and diverse crops. Sugar, tobacco, coffee, rice, and cotton are at present all raised, but in far smaller quantity than an efficient system of agriculture would produce. The agricultural methods employed by the natives are stated to be of the crudest, modern farming implements being practically unknown, and artificial fertilization unheard of. So naive is the attitude of the natives in this matter that lands which are not annually overflowed, and which therefore become exhausted in course of time, unless artificial means of re-fertilizing them are employed, are considered not worth cultivating. Not only would a modern system greatly increase present crops, but many new grains and fruits could undoubtedly be raised. A Bureau of Agriculture, similar to that in the United States, was established by the commission on October 8, 1901, for the purpose of conducting investigations and disseminating information in the islands with reference to the best methods of cultivation and the practicability of introducing new agricultural products.

Mining.—The extent of the mining resources of the Philippines is stated by the Philippine Commission to be unknown, though it is certain that there are large and widely distributed deposits of gold, copper, and coal, and to a lesser degree of lead, iron, sulphur, granite, marble, and petroleum. Many prospectors, the great majority of whom are Americans, went through the archipelago during 1901, and they have clamored for legal recognition and protection of their discoveries. "Some of them, after locating property which they believed to be valuable, and staying by it until their last dollar was gone, have been forced to abandon the attempt to secure recognition of their claims. Others are still holding on." Neither to American miners nor to those who made discoveries under the Spanish régime has the commission been able to grant any rights. Action in their behalf, however, is earnestly asked of Congress by the Philippine Commission through the extension to the islands of the American mining laws or some modification of them. While it is not believed that the mines are likely to prove to be Klondikes, it is considered that there are immense mineral resources to be developed, and that the exploitation of the coal of the islands will be of especial value to the United States navy.

Forest and Timber Products.—The total amount of land in the Philippine Islands is approximately 73,345,415 acres, of which 4,940,000 acres are owned by private individuals, leaving public lands to the amount of 68,405,415 acres. Of this great

public domain perhaps 40,000,000 acres are forest lands, constituting the most striking elements of wealth in the Philippine Islands. Pine, cedar, mahogany, hundreds of hardwoods, valuable dyewoods, rubber and gutta-percha trees exist in great quantities. Among the 615 varieties of trees now listed in the archipelago there are woods especially adapted for every use—for sea piling, for railway ties, for cabinet construction, for the extraction of oils, gums, and drugs. Many trees unknown and therefore undesired in the United States grow there, and also many varieties superior to those which are exported to the United States from Central and South America, and which would readily take their places at cheaper prices. The annual growth of all the forests in the islands is estimated at 1,400,000,000 cubic feet, or about three times the cut of lumber for 1900 in the entire United States. Of this amount more than 99 per cent. is annually going to waste, and yet there is a wood famine throughout the islands and the price of lumber is extremely high. This famine has been caused by the legislation passed by Congress for the Philippines (see UNITED STATES, paragraph Philippine Legislation), prohibiting the sale or other disposition of the public lands or of timber thereon, or of mining rights therein. Under this act the commission was obliged to prohibit the cutting of timber on government lands except by the issuance of licenses in cases of special necessity. Great inconvenience and some suffering was thereby caused, since there is comparatively little lumber on private lands, and because the devastation caused by the war and the improvements initiated under the American occupation, especially in the vicinity of Manila, have caused an abnormally large demand for timber of every kind. The entire amount of government timber cut between July 1, 1900, and June 30, 1901, was a little over 4,000,000 cubic feet, or less than one-third of 1 per cent. of the annual growth of the forests; and of the amount cut about one-half was used for government works, leaving many native property owners unable to rebuild their homes destroyed by the war and forcing the insular government to import from the United States nearly a million feet of lumber. Commenting upon these facts in his report for 1901, the secretary of war urged such legislation by Congress as would permit the building of necessary public works, the supplying of the wants of the people, and the exploitation of the forests by responsible persons under proper limitations and government supervision. See FORESTRY (paragraph Forestry in the Philippines).

Commerce.—Notwithstanding such obstacles to developing trade in the Philippines as the continuance of the guerrilla warfare, the lack of adequate transportation facilities in the interior, and the uncertain and fluctuating currency, the business of the islands considerably increased during the fiscal year 1901. The total value of the imports (exclusive of army supplies) was \$30,279,406 in 1901, as against \$20,601,436 for the previous year, and the total value of exports was \$23,214,948, as against \$19,751,068 in 1900, thus showing an increase of 47 per cent. in the value of imports and an increase of 17½ per cent. in the value of exports. The following table shows the trade of the Philippines by countries for the fiscal year 1901:

Countries.	Imports to Philippines. Fiscal Year 1901.	Exports from Philippines. Fiscal Year 1901.
United States	\$2,855,685	\$2,572,021
United Kingdom	6,956,145	10,704,741
Germany	2,135,252	81,526
France	1,683,929	1,934,256
Spain	2,161,352	1,655,255
China	4,339,941	73,701
Hong Kong	2,340,585	2,697,276
British East Indies	2,182,892	759,286
All other countries	5,623,625	2,736,886

Tariff.—By the decision of the Supreme Court of the United States (see UNITED STATES, paragraph Constitutional Status of Porto Rico and the Philippines), the question of tariff duties in the Philippines was left to the discretion of Congress. This decision, as stated by Governor Taft, was of much benefit to the Philippines, because the conditions prevailing were as different as possible from those in the United States. While it is true that free trade between the United States and the Philippines would have opened a large market to the sugar and tobacco planters, it would have necessitated a heavy internal tax to pay the expenses of the central government, whereas the Filipinos might reasonably expect now that Congress would give them a tariff suited to the development of the islands, and at the same time treating trade between the United States and the Philippines in a liberal manner.

Currency.—The question of the currency in the Philippine Islands, a matter of moment since the beginning of the American occupation, and discussed at length by

the Philippine Commission in 1900, acquired even greater importance during the year 1901, owing to the nearer approach of peace throughout the islands and the consequent necessity of preparing for their commercial and industrial development. Simply considered, the problem of the currency is this: The unit of currency throughout the archipelago, and the only currency with which the natives are familiar, is the Mexican dollar, whose value fluctuates with local trade conditions, with rates of exchange, and with the value of silver bullion in the trade centres of the world. As a fluctuating currency, the Mexican dollar is out of relation with the banking and commercial exchanges of Europe, and more especially of the United States, and trade, so easily deterred from entering new fields, is in every way checked. On the other hand, the Filipinos are accustomed only to the Mexican dollar and its subdivisions, and if the American dollar were suddenly and arbitrarily substituted for it, trade would be even more seriously hampered than at present, both on account of native prejudice and because the value of every monetary unit would be doubled at a time when the mass of the people were impoverished. The essence of the problem, then, is to bring Philippine currency in relation to the money of the world without at the same time upsetting established usage. That the problem is a pressing one in point of time, and may at any moment, until settled, give rise to acute conditions, is shown by three semi-arbitrary orders which the Philippine Commission issued toward the end of the year 1900. The commission found it necessary, first, owing to a general rise in the value of silver throughout the East, to levy a tax of 10 per cent. upon exports of silver from the Philippines; and the commission directed, secondly, in order to keep the Mexican dollar in commensurable ratio with American money shipped to the islands, that two Mexican dollars should be taken as the equivalent of one American gold dollar; and, thirdly, to prevent the established banks of Manila from mulcting the people, the commission ordered that no banker's commission should be thenceforth charged on exchanges of Mexican and American money. By these orders the currency problem was temporarily adjusted. The general situation, however, was stated by Secretary Root in his report for 1900 to be "in as bad a condition as is possible." And in order that adequate recommendations might be made to Congress looking toward a complete settlement of the matter, the secretary of war sent Mr. Charles A. Conant as a special commissioner to the Philippines early in 1901 to confer with the Philippine Commission and to make a final report upon the whole subject. The recommendations embodied in Mr. Conant's report, which was made public late in November, 1901, concurred with the recommendations made by the Philippine Commission in their annual report for 1901, and also with the recommendations made by the secretary of war in his annual report for 1900. These recommendations were in effect that the basis of future currency in the Philippines should be a Philippine silver dollar, minted at Manila, with a value in United States money of 50 cents; that this dollar should be divisible into a hundred equal parts, called *centavos*, and that minor coins equivalent to different numbers of *centavos* should also be coined. The Philippine silver dollar and its subdivisions should be issued by the Philippine government and should be maintained at par with American gold (1) by limiting the amount of silver coin minted, (2) by making the dollar of slightly less value than the Mexican dollar, so that it would not be exported, and (3) by maintaining an insular gold reserve derived from the seigniorage of silver coinage. By this plan it was believed that all Philippine money would be kept in relation with United States currency, and therefore with the currency of the world, and at the same time new Philippine currency could gradually take the place of the old, the Mexican dollar and its subdivisions, which would be used little by little as bullion for the making of the new coins.

Banking.—Closely related to the question of currency, and probably more important in its ultimate effect upon American trade in the Philippines, is the question of banking. This question, also, Mr. Charles A. Conant was directed to investigate, and, as in the matter of the currency, he reached conclusions practically identical with those of the Philippine Commission. There are at present, it appears, no American banking organizations in the Philippines, and the major part of the banking business is done by the Hong Kong and Shanghai Banking Corporation, the Chartered Bank of India, Australia, and China (both English), and the Spanish Filipino Bank. The first two are much the larger of the three, and both make a specialty of exchanges, doing little in the way of advancing money on native securities or notes. Both for this reason and because American capital is justly entitled to at least a fair share in the banking of the archipelago, it is proposed by Mr. Conant, and also by the commission, that the national banking law, with certain modifications, be extended to the Philippine Islands. It is recommended, first, that national banks in the United States shall have authority to establish branch offices throughout the islands, and also that other banks may be established having their main offices in the Philippines and branch offices in the United States.

While branch banking has hitherto been against the genius of banking laws in the United States, its great advantage in the Philippines would be to insure the credit and stability of Philippine financial institutions and to reassure capitalists dealing with them in a way which could not otherwise be done. In the second place, it is recommended that, in order to meet the future currency needs of a practically undeveloped country, the banks established may be allowed to issue notes up to 50 per cent. of their paid-up capital without depositing bonds in excess of one-fourth of their paid-up capital; but these notes shall, in lieu thereof, constitute a first lien upon all the assets of the bank excepting public funds, they shall pay a tax of one-half of 1 per cent. a year as a guarantee fund, they shall be protected by a cash reserve equal to 25 per cent. of the notes outstanding, and they shall be issued only by banks having a capital of half a million dollars or over. The national banks thus proposed would serve mainly to promote American commerce and industries in the islands. Another and hardly less pressing need is that some form of mortgage bank should be authorized in order to aid directly the agricultural interests of the Filipinos. The insurrection and the lack of improved methods have left the agriculture of the islands in a lamentable condition. Loans upon real estate mortgages in the islands command now an extortionate rate of interest, varying from 25 to 40 per cent. Mortgage banks whose solvency should be assured by proper precautionary provisions of Congress would do much to revive agriculture, to encourage the introduction of improved machinery, and by giving cheaper money would greatly add to the volume of the products of the earnings of the country.

Civil Government.—By the executive directions of April 7, 1900, with which the Philippine Commission was originally charged, it was made incumbent upon the commission to establish civil government in the islands as soon as possible, giving to the natives under this government the greatest degree of autonomy "consistent with the maintenance of law, order, and loyalty." In pursuance of these instructions, the commission passed an order on January 31, 1901, for the organization of municipal governments throughout the archipelago, and on February 6 for the organization of provincial governments. Towns under the municipal government act became municipal corporations, having the customary corporate powers. The municipal authority was to be exercised by a president, vice-president, and municipal council, elected for a term of two years by the qualified electors of the municipality. These qualified electors were to be persons who had held office under the Spanish government prior to the capture of Manila, or who owned property to the value of \$250 or paid an annual tax of \$15 or more, or who could speak, read, and write either Spanish or English. Under this act 765 towns had been organized by the end of 1901. The law for the organization of the provinces provided for a governing body consisting of the governor, treasurer, supervisor, secretary, and the fiscal or prosecuting attorney. In the establishment of the first provincial governments these officers were necessarily appointed by the commission; but it was planned, after February, 1902, to place the offices of secretary, treasurer, and supervisor under the civil-service rules, while the governor was to be elected in a mass convention of the municipal councils of the towns of the province. To the provincial government was given jurisdiction over the construction of highways, bridges, and other public works, the administration of criminal law in the province, the assessment and collection of taxes conjointly with municipal officials, and extensive supervisory power over municipal officers, the governor being empowered to suspend municipal officers, and to visit the towns of the province to inspect their administration, and to hold hearings in the case of municipal abuses. The organization of provinces under this act was made by the commission in a tour of the islands made for that purpose, beginning in February and ending in August. Provinces to the number of 35 were organized at this time, including nearly all territory in the archipelago which was at all accessible and whose population was sufficient to render an organized government advisable. Of these 35 provinces three proved to have been prematurely established and were turned back to the control of the military officers, leaving 32 in full operation. At about the same time, on July 31, the city of Manila was placed under a special government quite similar to that of Washington.

Judiciary.—Under the executive orders of April 7, 1900, outlining the duties of the Philippine Commission, a complete reorganization of the judicial system of the islands was directed. After investigation of the needs of the islands these directions were complied with by an order of the commission on June 11, 1901, establishing a supreme court for the archipelago, a court of first instance in each of the fourteen judicial districts into which the Philippines were divided for that purpose, and a justices' court in each municipality. To the justices' courts was given jurisdiction of petty cases; to the courts of first instances appellate jurisdiction over cases arising in the justices' courts, and also jurisdiction in all civil and criminal cases of moment, and to the supreme court appellate jurisdiction over the courts,

of first instance. The personnel of the supreme court was ordered to consist of seven justices, appointed as follows: Chief justice, Cayetano Arellano; associate justices, Florentino Torres, formerly attorney-general; Victorina Mapa, of Iloilo; J. F. Cooper, of Texas; James F. Smith, of California; Charles A. Willard, of Minnesota, and Fletcher Ladd, of New York. It will be seen from these appointments that while the chief justice of the court and two of the associate justices are natives of the Philippines, four associate justices, constituting a majority of the court, are citizens of the United States. In addition to these appointments, L. R. Wilfley, of Missouri, was appointed attorney-general of the islands.

Education.—Provision for the systematic organization of public instruction in the Philippine Islands was made by the commission on January 21, 1901, when an act was passed establishing a department of public instruction under the direction of a general superintendent and a superior advisory board, to consist of the general superintendent and four members, to be appointed by the commission. The archipelago was divided for educational purposes into 18 divisions, each to have a division superintendent, and such a number of deputy division superintendents as should seem desirable. At the same time, plans were made for bringing 1,000 trained teachers to the Philippines from the United States, not only to instruct Filipino children, but to instruct the Filipino teachers in English. Of these teachers 769 had been appointed and had reached the Philippines by the end of 1901. In addition to the American teachers, between three and four thousand Filipino teachers were engaged and entered upon their duties during the year. While the commission expected that all public instruction would eventually be given in English, this was, of course, at first impossible, although in 1901 all public instruction in Manila was in English. While no accurate figures are available showing the number of pupils in all the schools in the archipelago, the number of those enrolled in 1901 approximated 150,000, while the actual attendance was perhaps half that figure. In Manila alone the actual attendance in July was 5,123. Besides providing for regular instruction, the commission had also, by its act of January 21, 1901, authorized the establishment in Manila of a normal school for the education of natives in the island; for the establishment of a trade school in Manila, and also for the establishment of a school of agriculture in the island of Negros. The preliminary term of the normal school opened on April 10, and it was estimated that there would be some 350 in attendance. The number, however, was nearly double that, 570 studying throughout the term. One of the most serious problems which the commission believed would confront it in the establishment of a public school system, namely, the secularization of education and the prevention of religious proselyting in the schools, has in fact given no trouble whatever. The commission, in its order of January 21, 1901, laid down rigid rules forbidding any teacher in any of the schools to give religious instruction or to speak against or in behalf of any religion; but the commission at the same time stated that advocates of any religious belief might, upon permission being granted by the proper authorities, enter the schools and speak directly to the pupils upon the subject. Thus far, however, the commission remarks, its offer has not been taken advantage of, and no opposition has been manifested to its general order. Parents send their children, especially in Manila, to private Catholic schools when they do not desire to be bound by the commission's rule.

Public Works and Roads.—There is no harbor in the islands of sufficient draught for large vessels. The roads leading to the interior are in general mere trails, difficult to traverse at any time, and often impassable in the rainy season. For these reasons the native civilization, such as it is, is almost wholly confined to the sea-coast and nearby towns. Much of the interior of the great islands of Luzon and Mindanao is inhabited by people who have never been to the sea coast, or by wild tribes who were never within the jurisdiction of Spain. Recognizing that the remedy of these conditions was the first prerequisite to the commercial development of the islands, and would besides remove the greatest bar to the immediate pacification of the islands, the commission in 1900, immediately after its installation, passed preliminary acts to make the islands accessible from without, and the interior of the islands accessible from the sea coast. For improving the harbor of Manila, whose shallowness at present necessitates the lightering of the freight of all ships of over 16 feet draught, a million dollars was appropriated on October 15, 1900, and two million dollars more by a supplementary act of March 19, 1901. The plans for the improvements call for a depth of 30 feet within the harbor, thus doing away with lightering and reducing freight rates, which are now heavier between Manila and Hong Kong, about 700 miles, than the freight rate between San Francisco and Hong Kong, about 8,000 miles. For the improvement of roads, which in the absence of navigable waters leading to the interior are of special value, the commission, on September 12, 1900, made a preliminary appropriation of a million dollars. Acts leading to the construction of railways were beyond the jurisdiction

of the commission, but their annual report for 1901 emphasized the pressing need for them. There is at present but one railway in the archipelago, which extends from Manila to Dagupan, on the Gulf of Lingayen. The commission states that there should be constructed for immediate and future needs, first, a railway about 55 miles in length from Dagupan to Benguet, in the high interior portion of Luzon, where the cool and dry climate would be of great value for the recuperation of troops and foreign residents. Second, there should be two trunk lines, one crossing the island from east to west, a distance of perhaps 150 miles, and the other about 600 miles in length, extending from one end of the island to the other. Finally, there should be constructed in the island of Mindanao, whose area of something over 36,000 square miles is practically unknown except along the coast, not less than 500 miles of railway. The total cost of these proposed lines the commission estimates at \$55,000,000, and it recommends that Congress authorize responsible parties to build them, the insular government guaranteeing to the building corporation an interest of 3 per cent. upon the investment. Although there has been of late years a growing feeling in the United States against subsidizing railway enterprises, the commission believes that conditions in the Philippines to-day are not like those in the United States, but rather like those which prevailed in the United States fifty years ago, when subsidies by State and nation were freely made. Some of the proposed railways, the commission believes, would immediately be profitable, while others would be operated at a loss for a number of years, and therefore, as the need for the railways is urgent, some aid to encourage capitalists should be granted by the insular government. If grants of public lands were given by the commission instead of a guarantee of interest on the investment, the more speculative nature of the bonus would place the commission at a disadvantage in making terms with the railroads, while a guarantee of interest, on the other hand, would probably attract responsible capitalists at once, would conserve the public lands, and would, by the building of the railways without delay, open up great tracts of land for development, and thus largely increase the taxable property of the lands and allow the insular government to pay without difficulty the interest charges to the railroads.

The Monastic Orders.—Both in their report for 1900, made public on January 25, 1901, and in their report for 1901, made public in December of the same year, the Philippine Commission devoted considerable attention to the question of the monastic orders in the Philippines and the hostility of the Filipinos to them. The four monastic orders of importance in the Philippines, it appears, colloquially and collectively called the "friars," are the Dominicans, Augustinians, Recollectos (a branch of the Augustinians), and the Franciscans. These orders, with the exception of the Franciscans, who are prohibited by their rules from owning property, possessed at the time of the American occupation 403,713 acres of land in the province of Luzon, and more than 100,000 acres in the islands of Isabella and Mindoro. On these lands the friars had paid no taxes since 1880, but they rented out the lands in small parcels to the Filipinos and regularly collected the rents therefrom. Intense feeling against the friars gradually developed among the natives, and was perhaps the main cause of the revolution of the Filipinos against Spain. The reason for this feeling, as stated by prominent members of the monastic orders themselves, was that the friars represented and exercised the functions of the Spanish government in the islands. The friar in each town was usually the only Spanish-speaking person in the place. He necessarily stood as interpreter between the Spanish government and the people, and he came in time to exercise not only religious power, but civil and administrative power as well. He was himself exempt from civil procedure; his tenure of office was permanent; he was judge, jury, counsel, landlord, and adviser of the village. And therefore when the revolution came the expulsion of the friars was tantamount, in the view of the Filipinos, to the expulsion of the Spanish government. And *vice versa*, as the Philippine Commission remarked, if the friars should be allowed to return to their lands the Filipino people would look upon it as implying the return, by authority of the American government, of the same kind and degree of friar-power over them as had been previously exercised. Whether or not this feeling was justifiable was not, in the opinion of the commission, of moment; the feeling did exist and must be reckoned with. On the other hand, the property of the friars was protected, both under the provisions of the Treaty of Paris and by the fundamental principles of Anglo-Saxon jurisprudence. To escape the dilemma, therefore, the commission recommended that the insular government be authorized by Congress to issue bonds with which to buy up the agricultural holdings and other property of religious orders, and that the property when bought should be sold in small parcels to the present tenants on long payments. The proceeds from the sales, the commission believed, would ultimately be sufficient to meet fully the payment of the bonds. And although the monastic orders had, since the beginning of the American occupation, nominally, at

least, transferred or sold more than half their entire holdings, in fear, perhaps, of the United States declaring them forfeit, the commission stated that it considered itself in a position to say that the monastic orders would be willing to negotiate for the sale of their property to the government at reasonable prices. In its whole statement of the matter the commission emphasized the fact that the question was solely a political and not a religious one. The Philippine people not only have never objected to the Catholic religion, but have never known any other. "Excepting the Moros, who are Moslems, and the wild tribes, who are pagans, the Philippine people belong to the Roman Catholic Church. The total number of Catholic souls shown by the church registry in 1898 was 6,559,998." "It may be doubted whether there is any country in the world in which the people have a more profound attachment for their church than this one." The Catholic Church, then "ought to continue a prominent factor in the life, peace, contentment, and progress of the Philippine people." And wherever it is possible to do so without infringing upon the principle that church and state must be kept separate, civil laws should be framed to this end. But the return of the friars in the joint and anomalous position of spiritual adviser and landlord on a large scale, with absolute power of placing and removing tenants at will, should be prohibited.

The Slavery Question.—The uncivilized, or, as they are more conveniently called, the "non-Christian" people of the Philippines number perhaps 2,000,000. While many of the tribes into which these people are gathered are of feeble organization and power, others, like the Moros of the Sulu Archipelago, are closely knit, warlike, and of effective fighting ability. Several of the tribes, as the Indonesian, in the interior of Mindanao; the Malayan, of northern Luzon; and the Moros, occupying inaccessible strongholds in the mountains and capable of offering fierce resistance if aroused, are habituated to the practice of slavery, and in this practice they have not been disturbed by the United States government. The reason for this is purely military; if the tribes are inaccessible decrees aimed against them are futile, and in the case of the powerful Moros, with whom friendly relations have been established by the Philippine Commission, persuasion and gradual emancipation have been the means adopted for abolishing the practice. Technically the commission does not "recognize" slavery as existing among the Moros, while practically it insists that no future enslavements shall be made. This status the Moros willingly accept, profess high regard for the United States, and withhold their powerful aid from the insurrection. In the discussion of the subject in the United States, it appeared often to be assumed, though it was not often so stated, that the slavery practiced among the Moros was analogous to that in the United States previous to the Civil War. But this analogy is inferred by the Philippine Commission to be entirely delusive, both because of the radical differences in civilization, and because slavery among the Moros is of the mildest form, the slaves having usually sold themselves for debt, retaining, however, the right to repurchase their freedom. Moreover, the slaves are so treated that "the casual observer finds it impossible to distinguish them from members of the family to which they belong," and are said to be so well satisfied with their lot that "if they were all set free the majority of them would promptly return to their old masters and voluntarily take up their old life again."

The Federal Party.—The real importance of the Federal, or American, party in the Philippines, though fathered by the most distinguished Filipino office-holders under American rule and encouraged by the Philippine Commission, nevertheless appears difficult to estimate. There seems, that is, no means of gauging the extent to which the platform of the party, whose only plank of immediate significance is submission to United States authority, actually appeals to the Filipino people; and this perhaps still holds true notwithstanding that, in the words of the Philippine Commission, the party has "spread like wild-fire through the archipelago" since the first announcement of its platform on December 23, 1900, and has now committees in nearly every town of every province. That the people of the Philippines are utterly weary of strife and that the Federal party, whose representatives accompanied the Philippine Commission in its tour of the archipelago in the summer of 1901, will act as a powerful subsidiary means of bringing about peace, is not questioned. But whether the party may be regarded as an actual native organization of moment apart from and independent of its use as a subordinate piece of machinery to the Philippine Commission is another question. For, as stated by the Philippine Commission (see paragraph Political Outlook), the Filipino people, as a whole, "are at present incapable of appreciating any government except absolutism," and will be for at least a generation. "The educated people themselves, though full of phrases concerning liberty, have but a faint conception of what real civil liberty is, and the usual self-restraint which is involved in its maintenance." The truth of this statement would seem to carry proof that the Federal party should be considered, not as a political party in the sense that that term is understood in the United States and in civilized countries generally, but rather as one of the civil arms of

the commission for the pacification of the islands and the establishment of a government suitable to the needs of the people under the control of the United States. This view is furthermore strengthened by the history of the origin and formation of the Federal party, as given by its organizers, and more especially as given over the signature of the former attorney-general, Don Florentino Torres. From these statements it appears that when it became evident that the sovereignty of the islands would be transferred to the United States, "certain of the rich and educated residents" of Manila and adjoining provinces, including the present chief justice, Don Cayetano Arellano, determined to accept the new sovereignty and to form a party whose platform should in effect demand a territorial form of government for the Philippines as soon as the conditions should warrant it. The platform as finally adopted was the result of the combined efforts of the leaders of the party and of the first Philippine Commission, of which Mr. Schurman was president, and of the second Philippine Commission, of which Governor Taft is now president. The organizers of the party being at first "violently opposed by the great mass of the people, who were decidedly in favor of independence, and even of war to secure it," postponed until a more favorable opportunity active proselyting in behalf of the party. This occurred in December, 1900, when the re-election of President McKinley and the issuance of new orders by the military department of the Philippines (see UNITED STATES, paragraph Military Operations), warning all non-combatants, under severe penalties, to cease giving aid to the insurgents, had clearly shown the Filipinos that the war department, now demonstrably backed by public opinion throughout the United States, was determined to exchange a policy of leniency for one of war measures stringent enough to quell the insurrection absolutely. With all factors thus pointing to the uselessness of further resistance to the United States and to the increased danger of it, the Federal party, its propaganda once announced, rapidly gained adherents and became within a short time a large political body, at least as numbered by its adherents, and the only one of any importance in the islands. It appears in effect to represent the result of two years' effort by the most distinguished Filipinos, acting as a native advisory committee to the Philippine Commission. Many surrenders of insurgents to the American forces have been brought about by the party, and its influence, in translating, as it were, the intention of the United States government to the Filipinos, can hardly be overestimated.

Political Outlook in the Islands.—Toward the end of 1901 the political outlook appeared to become much simpler in character than it was in the preceding year. Such a view seemed to be justified by the successful establishment of municipal and provincial governments, the disappearance of any considerable opposition to the United States, and the knowledge gained by the Filipinos through official dealing with the American government. While it was no longer generally anticipated that within a brief time American institutions would flourish throughout the islands, there was, on the other hand, much less dismal prophesying of a continuous series of Filipino insurrections extending through indefinite years and thwarting all attempts for the maintenance of a stable civil government. That the Filipinos were heartily sick of the war and would not fight further for independence except under some extraordinary spur of discontent, or unless the American army should be withdrawn, seemed to be clearly established. It appeared, however, that owing to centuries of monarchical colonial control, the people were superstitious, ignorant, suspicious of governmental beneficence, and entirely unaccustomed to the checks and restraints, both upon officials and upon people, necessitated by a republican form of government. In establishing this government, then, great care would have to be taken, both to avoid too much experimental legislation and to keep at all times ultimate power in the hands of the Americans. The process of educating the Filipinos to govern themselves could not but be laborious. The degree of enlightenment existing in the islands may be illustrated from the fact that at present only about 10 per cent. of the Filipinos speak the Spanish language, and that of 2,695,801 inhabitants of 390 selected municipalities only 49,523, or 18.37 per 1,000 inhabitants, were able to meet the liberal suffrage qualifications (see paragraph Civil Government) laid down by the Philippine Commission. In view of these facts, the commission recommended in its report for 1901 that the government then existing in the Philippines under executive orders be continued until January, 1904, and that at that time Congress institute a territorial form of government similar to that which Congress had enacted in 1900 for Porto Rico. That is to say, a government should then be instituted providing for a governor, an executive council, and a popular legislative assembly: the executive council constituting the upper chamber of the territorial congress, to consist of members appointed by the President; the legislative assembly to be composed of natives chosen by the qualified electors; and the action of this congress to be subject to the absolute veto of the President or Congress. But the wishes of the territorial congress were to be interpreted at Washington by two native delegates elected to represent the archi-

pelago. In commenting upon the reasons for delaying this proposed government until 1904, the commission laid stress upon the fact that at the present time government, in the opinion of the Filipinos, means absolutism; that this idea had been drilled into them by the methods employed by the Spanish representatives in the islands; and that, as shown by acts of the native mayors and councils of municipalities already appointed, it would take the Filipinos some time to understand, first, that government does not derive its normal powers from the spoils system; and second, that officials are limited in their powers both by officials with superior or complementary powers and by their constituency, who have the right to turn them out of office. For military operations in the Philippines, see UNITED STATES (paragraph Military Operations).

PHOSPHATE. The production of phosphate in the United States in 1900 amounted to 1,491,216 long tons, valued at \$5,359,248, as compared with 1,515,702 long tons, valued at \$5,084,076, in 1899. There was a decrease in production in Florida and South Carolina, on account of the scarcity in the transportation facilities, and also the low prices for superphosphates. The production of Tennessee increased, but that of Pennsylvania decreased over 50 per cent. There was a slight production from Alabama and Arkansas, but none from North Carolina. The average price per ton in 1900 varied considerably. That of Florida River pebble was \$2.36; land pebble, \$2.77; and hard rock, \$5.25; the average price of South Carolina land rock, \$3.30; and Tennessee phosphate, \$2.92. The imports in 1900 were valued at \$1,420,918. During 1901 there was found in Decatur County, Tenn., an extension of the white phosphate area of Perry County.

PHOTOGRAPHY, STELLAR. See ASTRONOMICAL PROGRESS.

PHOTOGRAPHY, MEDICAL. It was reported in March, 1901, that Dr. Lange and Dr. Melzing had succeeded in taking large photographs of the interior of the living human stomach. Their method is as follows: The stomach is emptied and washed by means of the ordinary stomach tube and then filled with air. A tube is then introduced having in its lower end an electric lamp and at its upper end a camera. In from ten to fifteen minutes 50 pictures can be taken. The apparatus is turned on its axis, so that all parts of the mucous membrane can be exposed. The resulting photographs are about one-fifth of an inch in diameter, and can be enlarged to any desired size.

PHOTOTHERAPY. Niels R. Finsen, of Copenhagen, continued his experiments with light in the treatment of carcinoma and lupus during 1901. He regards the experience of the past four years as very limited. He finds that the strongest bactericidal power of the electric light resides in the ultra-violet rays. By substituting quartz for glass lenses in electric-light concentrating apparatus he has greatly advanced the treatment. He has known the dilatation of cutaneous vessels caused by the chemical (ultra-violet) rays to endure for a half year. He decides, from comparison of the different factors acting on the skin, that the normal rosy color which the skin acquires when uncovered is induced by the chemical rays, retarded by heat, and promoted by cold. Pigmentation is therefore no more important a phenomenon than the photo-chemical inflammation of the skin. Several others have had equal success with Finsen's system of local light baths in treatment of lupus, notably Morris and Dore, in 1901, with electric-light rays. They have been successful in all cases where there was an absence of scarring, pigmentation, great vascularity, great depth below the surface, involvement of eyelid or mucous membranes, or great extent of lesion. Leredde, of France, reported in 1901 the results of phototherapy upon 11 patients suffering from lupus erythematosus of the face. Of his cases 3 were cured, 2 were improved and passed beyond his observation, 4 were being cured at the time of the report, and 2 showed no improvement. Each of these 11 cases had been rebellious, having been treated persistently with all other known methods without result before coming into his hands. In August, 1901, Dr. Sophus Bang, assistant of Dr. Finsen, announced his invention of a new electric lamp for phototherapeutic uses. He claims that its bactericidal power is ten times that of the ordinary arc lamp previously employed by Finsen in the treatment of lupus. See RÖNTGEN RAYS IN MEDICINE.

PHYSICS. The amount and quality of the investigations in physics accomplished or in progress during 1901 equals if not exceeds that of any recent year, though this progress is characterized by general activity rather than by discoveries of extraordinary importance. The Nobel Prize (*q.v.*) in physics was awarded to Professor Röntgen (*q.v.*) for his brilliant discovery of the X-rays, and is a somewhat rare instance of a worker in pure science obtaining a direct material reward. The death of Professor Rowland (*q.v.*) removed from the ranks of American physicists a most distinguished scientist, while that of Rudolph Koenig (*q.v.*), of Paris, famous both as a theoretical worker in acoustics and as a maker of apparatus of high precision, was also widely felt. Of the discoveries that have been utilized for practical purposes, the storage battery of Edison (see STORAGE BATTERY, EDISON)

and the Cooper Hewitt mercury vapor tubes for electric lighting (see **ELECTRIC LIGHT AND POWER**) are of note. There has been an increased interest in physical laboratories by the various governments. A new office of standards has been established at Washington; at the English Physical Laboratory important investigations are in progress; and the usual activity has been manifested at the Reichsanstalt at Charlottenburg, near Berlin.

The National Bureau of Standards.—The beginning of a national physical laboratory in the United States was made in 1901, and the National Bureau of Standards was established by act of Congress approved March 3, 1901, the new bureau taking the place of the office of standard weights and measures of the Treasury Department. Professor S. W. Stratton, a prominent physicist who for a number of years had been a member of the faculty of the University of Chicago, was chosen as director, and the bureau, in both its administrative and scientific branches, has been organized. It is hoped that the new department will develop so as to occupy in the scientific and industrial world a position similar to that of the Reichsanstalt, or Imperial Testing Bureau, at Charlottenburg, Germany, the researches of which have enjoyed a world-wide renown and have been of the greatest practical benefit to German engineers, manufacturers, and instrument makers. The functions of the new bureau at Washington are to preserve the national standards, and to compare with them and the secondary standards the various weights, measures, and other standards used in scientific investigation, engineering, manufacturing, commerce, and in educational institutions. The bureau also undertakes the construction of standards and the calibration of standard measuring instruments. This work will be done for the national government and the governments of the separate States, and, upon payment of fees, for private individuals, corporations, or institutions. In addition, various physical investigations to determine the properties of materials or other useful scientific tests will be carried on, particularly when these are not possible by smaller laboratories, owing to the lack of resources and apparatus. The Bureau of Standards is being equipped with the most modern appliances and apparatus, and a site has been secured for a large laboratory for which plans have been drawn. The scheme provides for the erection of a physical laboratory and a smaller building that is to serve as a power plant and mechanical laboratory. This building, it was expected, would be ready for occupancy by January 1, 1903. At the present laboratories of the bureau, in the building formerly occupied by the office of weights and measures, there have been carried on, in addition to comparisons of measures of length and weight, photometric measurements and the testing and calibration of high and low temperature thermometers and pyrometers, clinical thermometers, chemical glass measuring apparatus, electrical measuring instruments and standards, polariscopes, pressure gauges, and meteorological instruments. The establishment of this bureau has been demanded for a number of years by the scientific men of the country, and it should prove eminently useful, particularly if its work is maintained at the high standard characterizing the other scientific bureaus in Washington. If the present attempt to introduce the metric system into the United States is successful, the part to be played by this bureau will be most important, as it possesses the metric standards with which even now the present standards are compared.

The American Physical Society.—This society met in April and December at Columbia University, New York City. Professor A. A. Michelson, of the University of Chicago, was elected president, to fill the vacancy caused by the death of Professor Henry A. Rowland, who had served as president of the society since its foundation. At the annual meeting of the society, held in New York at Columbia University during convocation week, a number of important papers were presented and the following officers elected: President, Professor Michelson; vice-president, Professor Arthur G. Webster, of Clark University; secretary, Professor Ernest Meritt, of Cornell University; treasurer, Professor William Hallock, of Columbia University; trustees, Professor E. H. Hall, of Harvard University; Professor D. B. Brace, of the University of Nebraska; and Professor Carl Barus, of Brown University.

Gravity Investigations.—To determine the value of the force of attraction which the earth exerts on bodies at or near its surface, is the purpose of an investigation carried on by the International Geodetic Association. Gravity, like other forces, varies inversely as the square of the distance, and in the case of the earth the force acts as if it were situated at the centre. As the earth is an oblate spheroid, with a greater radius at its equator than at its poles, it follows that the amount of gravity must vary with the latitude. To measure this quantity, pendulums having a period of oscillation of one-half second are allowed to vibrate at different stations, and the time consumed in making a single oscillation is accurately determined with a chronometer. In order to determine the absolute value of gravity, a comparison of observations is made and the average value is carefully com-

puted. In 1900 gravity observations were made in Washington by G. R. Putnam, of the Coast and Geodetic Survey, and also abroad at Kew, Greenwich, London, Paris, and Potsdam. At all of these places numerous observations had been made previously, those at Potsdam having been pursued with great care and accuracy. When, as a result of computation, a standard value is obtained, it will be possible to reduce and publish the many gravity observations that have been made throughout the United States. The value for this important constant, adopted in 1892, was 980.098, and subsequent observations, including those of 1900, give the value of gravity for Washington as 980.111. It is not likely, however, that this will be altered substantially by the final results of the computations of the International Geodetic Association and the Potsdam observers.

Magnetic Survey.—The division of terrestrial magnetism of the United States Coast and Geodetic Survey is busily engaged with the general magnetic survey of the United States, and considerable progress has been made. This bureau co-operates in the international magnetic observations which were arranged to begin on a systematic plan on January 1, 1902. For this purpose the United States maintains four stations, which are located at Sitka, Alaska; near Honolulu, Hawaiian Islands; Cheltenham, Md., near Washington, D. C.; and Baldwin, near Lawrence, Kan. These stations have been equipped with recording magnetometers, and valuable observations are anticipated. Plans were made for much magnetic work on the various Arctic and Antarctic expeditions, and an increase of knowledge in this field is looked for.

Spectrum Investigations.—An event of considerable importance to students of physics was the publication in the spring of 1901 of Volume I. of the *Annals* of the Astrophysical Observatory of the Smithsonian Institution. This publication represents some twenty years' work by the director, Professor S. P. Langley, and includes the use of the bolometer for investigating the spectrum far beyond the visible limits. On April 18, 1901, at the annual meeting of the National Academy of Sciences at Washington, Professor Langley submitted a paper on *The New Spectrum*, in which he traced the development of the study of the spectrum since the invention of the bolometer. This paper, which will be found in the *Annual Report* of the Smithsonian Institution, was designed to accompany the presentation to the scientific world of the *Annals* already mentioned, and is of interest as summarizing briefly and concisely the advances made in this department of spectroscopy during the past quarter century. That light passing through a prism is decomposed into a series of different primary colors, or a spectrum, was well known to Sir Isaac Newton, while the fact that there are rays beyond the limits visible to the human eye capable of affecting a thermometer was realized at the beginning of the last century, and the study of these rays lying beyond the visible limits was carried on either with the aid of a thermopile or photographically until the invention of the bolometer. This instrument, which was invented over twenty years ago by Professor Langley for the study of solar radiation, consists of a thin strip of platinum the electrical resistance of which increases when radiant energy falls upon it; or, in other words, when its temperature is increased. This increase in resistance can be detected and measured with a galvanometer. By placing this simple instrument at various points in the spectrum, we can detect the place and amounts of the energy received. The spectrum that is visible to the eye is produced by rays the wave length of which, to use the language of the physicist, varies from $.76\mu$ to $.4\mu$ (μ representing a unit of length equal to one thousandth of a millimeter). The waves producing this visible spectrum are only a small part of those which can be detected, and we have the vast spectral regions of the infra red, which lie just beyond the longer waves just referred to, and the ultra-violet waves at the other end of the visible spectrum. Instead of a prism of glass, which is generally understood to be used for the production of a spectrum, one of rock salt is used, for the reason that it does not cut off the longer or heat waves.

So sensitive is the bolometer as now arranged that it will respond to a change of one one-millionth of a degree centigrade. In the modern instrument the rock crystal prism is protected from moisture and mounted on a clock-work mechanism that causes it to revolve and consequently allow different portions of the spectrum to fall successively on the bolometer. Any change in its resistance of course produces a deflection of the galvanometer, from whose mirror a beam of light is reflected and falls upon a photographic film which moves synchronously with the prism. In this way a record is obtained of the amount of radiant energy in the different parts of the spectrum, and the lines and bright spots can be as accurately located as in the case of the visible spectrum. What Professor Langley terms "the new spectrum" is that portion lying between wave lengths of 1.8μ and 5.3μ , and to this he has devoted considerable research. This investigation has required the most careful manipulation and skill, and stands as one of the best examples of original physical research of recent years. It is of course capable of almost indefinite ex-

tension, and it seems as if further study might lead to results of practical as well as purely scientific value. This is indicated by the concluding paragraphs of Professor Langley's paper, where he states in his observations the changes in the energy spectrum of the sun were clearly evident, and as the sun was always at the same altitude and as its rays traversed the same absorbing quantity of atmosphere, it was fair to assume that some of the changes were in the sun itself, though the major part were probably in the earth's atmosphere. Further investigations may serve to throw light on these questions, and as all life on the earth is maintained by the sun, a knowledge of its characteristics would doubtless have wide application. The coming of the seasons, whose future characteristics were indicated in the spectral records, could be made of use to agriculture, just as the bulletins of the Weather Bureau serve for more immediate purposes. Professor Langley concludes by saying: "We are yet, it is true, far from being able to prophesy as to coming years of plenty and of famine, but it is hardly too much to say that recent studies of others, as well as of the writer, strongly point in the direction of some such future power of prediction."

The investigation of the spectra of hydrogen under different conditions, which was carried on so successfully by Professor John Trowbridge, of Harvard University, in 1900, was continued and further reports published during 1901. Professor Trowbridge has reached the conclusion that the lines in the spectrum of hydrogen ordinarily seen are not characteristic of this element, but of water vapor which is present in the tube containing the gas. Furthermore, this water vapor is necessary for the passage of the electricity through the tube which raises the gas to such a temperature that when the tube is placed at the slit of a spectroscopic it furnishes a spectrum. Dewar's experiments, showing that liquid hydrogen is an insulator, tend to corroborate this view. The increased conductivity of hydrogen tubes through which a current has been passed for some time, is explained by the fact that oxygen is set free and unites with the hydrogen to form aqueous vapor.

Among other spectroscopic investigations of 1901 may be mentioned Lehman's work on the infra-red spectrum of the alkaline metals rubidium and cesium. It will be remembered that light and heat radiations that do not affect the eye can nevertheless be detected by photography or by the use of the bolometer. In this case the investigator prepared a plate that was sensitive to waves of as great wave length as $1,000\mu$ (μ being here equal to one-millionth of a millimetre). The source of light was an electric arc between electrodes of the metals under study. New lines were discovered of which some have a wave length as great as 851.326μ in the case of rubidium and 931.186μ in the case of cesium.

Radio-activity.—The study of radio-active substances has been pushed forward by a number of workers, and steadily our knowledge of these substances and of the energy emitted is being increased. The chemical effects of the radiations from radium have been investigated, and it has been found by Berthelot that in certain cases (I_2 and HNO_3) substances are decomposed; but other materials in which decomposition is produced by the action of light are not changed. Chemical changes due to these rays have also been noticed by Becquerel, and it has been found that seeds exposed to their action before being planted would not germinate. Another curious effect produced by these rays is a soreness of the skin of a person on which they fall. This has been noticed both in the case of radium and barium chloride, the material being contained in a sealed glass tube. Professor J. C. McLennan, of Toronto, has also done considerable work with radio-active substances. He has found that a large number of salts become radio-active for a time when being warmed, and that substances when heated show increased radio-activity to a certain point. He also obtained induced radio-activity from radium salts in solution, and furthermore found that certain substances under the influence of cathode rays become radio-active. It is in the study of radio-activity that as satisfactory progress is being made as in any department of physics, and nearly every issue of the *Comptes Rendus* and other scientific periodicals contains a description of experiments or observations in this field.

In connection with the discovery and further investigation of radio-active substances, it is interesting to note that selenium is affected in the same way by radiferous substances as by light and X-rays. It will be remembered that in 1873 Willoughby Smith discovered that the electrical resistance of selenium diminished when exposed to light, and that a similar effect was noticed by Peneau in 1899 when he submitted the substance to the X-rays. Eugene Bloch, in a paper before the *Académie des Sciences*, has shown that when exposed to the radiations from radiferous carbonate of barium the resistance of a selenium element would fall rapidly, though to a less extent than in the case where exposed to light.

Theories of Matter.—In 1901 Lord Kelvin contributed to the *Philosophical Magazine* important papers dealing with the ether and matter in general. One of the

communications, first presented to the British Association for the Advancement of Science at its Glasgow meeting, discusses the clustering of gravitational matter, and deals with its presence and distribution in the universe, together with its various changes and transformations. Lord Kelvin in this discussion assumes that the law of gravitation first enunciated by Newton holds good throughout infinite interstellar space, just as it has been shown by astronomers to hold good for certain interplanetary spaces. In other words, as we have a definite knowledge of the working of this law, we may assume it to be universal. The ether, in which the movements known as light, heat, and electricity occur, according to Lord Kelvin, is matter, yet it is not gravitational matter, for in such case it would be necessary to consider it infinitely incompressible, an improbable assumption. Lord Kelvin believes that if there was in the universe at some remote period—say twenty-five million years ago—a certain amount of matter equivalent to that of a thousand million suns, this matter in the course of time would have acquired such a velocity as the stars are supposed to have. From the matter at rest solid bodies would ultimately form, as the density of the distribution would vary, and as a result of collisions trains of waves would be produced in the ether which would carry energy away to infinite space and produce the cooling of the masses. Such cooling would produce the well-known meteoric stones.

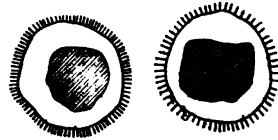
Radiation Pressure.—One of the most interesting and important investigations of 1901 was carried on by Professor E. F. Nichols and G. F. Hull, and seems to demonstrate that there is an actual mechanical pressure due to the radiations of light and heat. In previous mathematical reasoning connected with the consideration of the electromagnetic theory of light this conclusion was reached, but it has never been successfully demonstrated in an actual experiment until recently. The apparatus employed consisted of a delicate form of torsion balance where the effects due to the surrounding gases, which had been the chief obstacle in the way of previous experiments, were made as small as possible. This was accomplished by making the receiving surfaces or vanes of the balance reflectors, exhausting the containing vessel, comparing the effect of the forces due to the radiation and those due to the gases, and finally by using a ballistic method of measurement, since any pressure or force due to radiation would be instantaneous in its action, whereas any effect due to the gases would increase with the time. The reflectors that received the radiation were made of two thin disks of glass, coated with silver on opposite sides and delicately suspended so that dissimilar surfaces were presented toward the source of light. The rays of light passed through a system of lenses and plates of glass, and were allowed to fall first on one and then on the other of the disks, and the displacement was measured by a reflecting mirror and a telescope and scale. It was shown that there was a pressure due to the radiation which was not due to the gases surrounding the vane, as there was a difference in the forces acting on the different reflectors. The amount of radiant energy was measured with a bolometer, and the greatest manipulative skill was evinced throughout the experiment. The question which has thus been opened up promises to afford opportunities for study on the part of students devoted to mechanics and physics, and towards the end of the year 1901 the investigation was widely discussed. Inasmuch as the pressure produced by the sunlight on the surface of the earth or other bodies can be computed, it prepares the way for many interesting calculations. In Europe a similar discovery by Professor Lebedew, of Moscow, has brought the subject to the attention of English and Continental scientists.

Improved Air Pump.—During 1901 an improved form of Spengel mercurial air pump was constructed by G. W. A. Kahlbaum and described in the *Annalen der Physik* (No. 11, 1901), by means of which he obtained an exhaustion equal to a pressure of .0000018 mm. of mercury, or about one four-hundred-and-twenty-millionth of an atmosphere, which is believed to surpass all previous attempts at securing a vacuum. In obtaining high vacua many difficulties have been encountered by investigators, chief of which has been the electrification of the glass by the friction of the falling mercury. This Kahlbaum has avoided by using for his fall tube a steel gun barrel. He also has employed a special preparation for his glass joints and taps which prevents leakage.

Silica Tubes.—The discovery that silica can be manipulated at high temperatures, made in 1900, was put to a more extended use in 1901, and Shenstone in England was able to construct not only thermometer tubes but other physical apparatus, such as gas and vacuum tubes. For many researches these tubes possess numerous advantages, on account of their small expansion and their resistance to high temperatures. Their disadvantages are that they are slightly permeable to hydrogen at about 1,000° C., and are attacked when hot by alkaline oxides. They are better to use than glass in studying the ultra-violet rays, and possess the marvelous property of being able to withstand immersion in water or even liquid air when hot without fracture or other injurious effect.

PHYSIOLOGY, CHEMICAL. Researches concerning the physiological rôle of salt solutions have been growing in number and importance, and Ostwald's prediction that physiology will derive new life from the modern theories of physical chemistry seems to be gradually coming true. However, the greatness of recent achievements has doubtless been much exaggerated by the popular press; for certain periodicals have not hesitated to assert that the mysteries of life and mind are now dissipated by chemical theory. Leaving the problem of forming a truer estimate to the future, we will confine the present article to a brief account of facts brought to light during 1901.

Artificial Parthenogenesis.—In a paper published in January, 1901, Professor J. Loeb, of the University of Chicago, gives an account of his successful experiments with *Chaetopterus* (a worm). It will be remembered that in his previous papers the author had announced the discovery that unfertilized eggs of sea-urchins (echinoderms) are capable of developing without the agency of spermatozoa, if kept for some time in sea-water whose concentration has been increased by the addition of salts. Now, in his January paper, he shows that the same is true of annelids. It suffices to leave the unfertilized eggs of *Chaetopterus* for one hour in sea-water to which some common salt, or the chloride of calcium or magnesium, or a little hydrochloric acid, or even some ordinary cane sugar, has been added, and the eggs are rendered capable of developing into swimming trochophores. Unlike those of the sea-urchin, the eggs of *Chaetopterus* can thus be "fertilized" also by a solution of the chloride of potassium, whose concentration ("osmotic pressure") is much lower than that of sea-water; which seems to indicate that potassium has a powerful specific effect on the eggs of *Chaetopterus*. It may be of interest to note that parthenogenetic development is somewhat slower and in certain respects different in character from that of eggs fertilized by spermatozoa, and that its character depends to a great extent on the salt employed, the latter determining the nature of the segmentation and the distinctness of the single cleavage spheres. Nevertheless, it is evident that potassium salts as well as spermatozoa have essentially the same effect, viz., an accelerating effect on the development of the ovum, but for which it would die. The fact that spermatozoa have been found to contain a high percentage of mineral matter even suggests the possibility that the function of the spermatozoon of *Chaetopterus* is, primarily, to introduce into the ovum a salt of potassium. The reason that the spermatozoon of an *Arbacia*, for instance, is incapable of fertilizing the ovum of *Chaetopterus* may then be simply in the fact that that spermatozoon does not contain the potassium salt necessary for *Chaetopterus*. But now that the development of the ovum can be started artificially, it may be possible to cause the *Arbacia* spermatozoon to blend its hereditary characteristics with those of *Chaetopterus*, and thus produce a cross between quite distant animals. In this direction Professor Loeb has as yet obtained only negative results; but he trusts that artificial parthenogenesis will ultimately render such hybridizations possible. A more immediate problem that remains to be solved is to keep the larvae from unfertilized eggs alive until they reach the stage when animals produced normally begin to exhibit the differences of sex. Will the parthenogenic beings have sex?



In course of the year S. J. Hunter found that parthenogenesis can be produced in sea-water by simply allowing its concentration somewhat to increase by evaporation. A. W. Greely made the unfertilized eggs of starfish to develop into bipinnaria by exposing them for several hours to a relatively low temperature (about 42° F.). Finally, A. P. Mathews found that the unfertilized eggs of starfish can be made to develop into bipinnaria by mere mechanical agitation, often very slight, in ordinary sea-water and at ordinary temperatures. Besides possibly having an importance of its own, this last fact is interesting as a possible source of error in experiments on artificial parthenogenesis produced by other means.

The Action of Salts on Muscles.—In a paper published in July, 1901, Professor Loeb gives an account of an interesting series of experiments which showed that certain salts may produce a peculiar form of muscular irritability: a muscle which has, namely, been kept for some time in a solution of the carbonate, oxalate, citrate, or tartrate of sodium, will contract powerfully if transferred into air, carbonic-acid gas, sugar solution, or glycerin. The author believes that facts of this nature may in course of time explain many phenomena of hysteria, neuroses, etc. In a paper published in December, 1901, W. H. Howell communicates some interesting observations concerning the effect of salt solutions on heart muscle and similar tissues. It has been discovered within recent years that such tissues will for a long time beat rhythmically if kept in solutions of inorganic salts. Howell now finds that the contractions last longest in solutions containing salts of sodium,

calcium, and potassium, and can hardly be maintained at all if either sodium or calcium be absent. He believes that an important function is performed by such salts in the living organism, the salts possibly giving to organic compounds a form in which their energy becomes available.

The Effect of Salts on the Viability of Eggs.—At the December (1901) meeting of the Physiological Society, Professor Loeb announced the following discovery: Eggs of *Fundulus* (a fish) lose their power of development and die in solutions containing salts of monobasic acids with monovalent metals (e.g., the chloride, nitrate, or acetate of sodium, lithium, or potassium). Salts of divalent, and especially of trivalent, metals are even more poisonous; yet the addition of small amounts of them to solutions containing monobasic acids and monovalent metals has the wonderful effect of completely destroying the toxic properties of the latter, so that in the mixed solution the eggs live and develop in a normal manner. The author makes an attempt to explain these phenomena by the modern theory of solutions. According to the latter, a salt, when dissolved in water, breaks up into "ions" (i.e., atoms or groups of atoms charged with electricity); the metallic atom of the salt takes on a charge of positive electricity and becomes "a positive ion"; the acidic component of the salt takes on a charge of negative electricity and becomes "a negative ion." Thus, ordinary salt (sodium chloride), whose molecule is represented by the formula NaCl , breaks up, when dissolved, into positive ions Na and negative ions Cl . The ions of a monovalent metal like sodium carry a single charge of electricity; those of a divalent metal like calcium carry a double charge; and, accordingly, an ion of calcium is represented by the symbol Ca . Professor Loeb believes that the toxic effect of salts is due to the negative electricity carried by their acidic components (like Cl), and that the powerful antitoxic effect of salts like those of calcium is due to the fact that their metallic ions carry a double charge of positive electricity.

Even more interesting are the observations made by the same investigator jointly with W. H. Lewis. A series of careful experiments showed that the life of unfertilized eggs of sea-urchins can be considerably prolonged by means of the powerful poison potassium cyanide. If the eggs are left in normal sea-water at ordinary temperatures, they gradually lose their power of development; the power to reach the pluteus stage is lost in one day, and in two days even the power of segmentation is lost—the eggs die. But if a certain amount of potassium cyanide is added to the water, the eggs may be kept in it nearly five days without losing their power of developing into plutei, and a full week without completely losing their power of segmentation. The investigators consider it beyond doubt that the effect of the poison is due not to its preserving the eggs from bacteria, but to its checking the progress of mortal processes of disintegration. The phenomenon has, therefore, in certain "popular" accounts, been described as "a promise of long life."

The Nature of Nerve Impulse.—Dr. Albert P. Mathews advanced a new hypothesis concerning the nature and mechanism of nerve impulses. According to Professor Hardy and others, the particles of a colloidal solution (i.e., a solution of substances like gelatin, albumen, etc.) are charged with positive electricity; negative electricity causes such a solution to gelatinize (precipitate). On the other hand, according to the observations of Loeb and Mathews, nerves are stimulated by electro-negative charges. Mathews considers the substance of nerves as a colloidal solution of certain fats, and therefore assumes its particles to be charged with positive electricity. The mechanism of stimulation by negative electricity he believes to consist in a precipitation of particles of fat. In accordance with the views of Helmholtz and Quincke, he assumes the electro-positive colloid particles in solution to be surrounded by an electro-negative layer in the solvent (water). When heat or some other agency causes several colloid particles to coalesce into one, part of the electricity in the negative layer is set free, and this at once causes a precipitation of fat in the immediate vicinity; the precipitation itself consists, of course, in a coalescence of colloid particles, and hence, in its turn, sets free a certain amount of negative electricity; the latter causes precipitation at the next point in the nerve, and so forth; and thus the impulse travels all along the nerve. Dr. Mathews further points out the fact that anæsthetics (ether, chloroform, etc.) are, as a rule, excellent solvents for fats; he believes that while negative electricity stimulates the nerves by precipitating fats, anæsthetics, on the contrary, destroy irritability by dissolving them.

PIATTI, CARLO ALFREDO, Italian musician, died near Bergamo, Italy, July 19, 1901. He was born at Bergamo, January 8, 1822, and was educated in music principally under Merighi at the Conservatory of Milan, where he made his début as a cellist in 1834. After playing in different countries of Europe (1838-44), he made his first appearance in London, where he was cordially received. In 1859, when the popular concerts were founded, he was made chief cellist, a place he held until 1897, when ill health compelled him to relinquish it. Technically, Signor Piatti was

a master; and he excelled also in emotional expression and a fine interpretative perception. He was the author of two 'cello concertos and other works for the cello, and edited string music of other composers.

PIERCE, GILBERT ASHVILLE, former United States Senator from North Dakota, died in Chicago, February 15, 1901. He was born at East Otto, N. Y., in January, 1841, and at 13 was taken by his parents to Indiana. He graduated in law at the University of Chicago, and at the outbreak of the Civil War entered the Union army in the Ninth Indiana, and served throughout the conflict, rising to the rank of colonel in the regular army. For one year, 1868-69, he was in the Indiana assembly, and for twelve years, 1871-83, was associate and managing editor of the *Chicago Inter-Ocean*. President Arthur appointed him territorial governor of Dakota in 1884, which office he held until 1886, and upon the formation of the State of North Dakota he was elected senator for the short term, 1889-91. Failing a reelection, he purchased the *Minneapolis Tribune* in 1891 and was its editor until 1894, when he retired from active life on account of poor health. He was appointed minister to Portugal in 1893, but resigned shortly afterward. Senator Pierce wrote many stories and sketches, some plays, and (1875) the *Dickens Dictionary*.

PILLSBURY, JOHN SARGENT, former governor of Minnesota, died at Minneapolis, October 18, 1901. He was born at Sutton, N. H., July 29, 1828, and engaged in various kinds of business until 1855. At this time he went to Minnesota, where he became connected with the flour-milling concern of Charles A. Pillsbury & Co. The business grew to gigantic proportions, and with his great wealth Mr. Pillsbury devoted much attention to philanthropic and educational work. In 1863 he was appointed a regent of the University of Minnesota, for which, in 1889, he built and equipped a new science hall at a cost of \$150,000. From 1864 to 1876 he was a State senator, and was active in all political life of the State. As governor (1876-82) he was instrumental in saving the credit of the State by preventing the repudiation of its railway bonds. Among his numerous gifts to the city of Minneapolis were a girls' home and a commodious library building.

PINGREE, HAZEN SENTER, former governor of Michigan, died in London, England, June 18, 1901. He was born at Denmark, Me., August 30, 1840, and was trained as a shoe cutter in Massachusetts. After serving through the Civil War in the Union army, he settled at Detroit, Mich., and in 1866, with C. H. Smith, established a shoe factory, which developed into the largest of its kind in the West. He served as mayor of Detroit from 1889 to 1896, and attained prominence by his successful project of turning over vacant city lots to the poor for the cultivation of vegetables, and also by his fights against street railways and other combinations. It was by his unique scheme for utilizing vacant lots that he earned the title "Potato Patch" Pingree. In 1896 he was elected governor of Michigan, and was reelected in 1898.

PIPER. Mrs. LEONORA. See PSYCHICAL RESEARCH, SOCIETY FOR.

PI Y MARGALL, FRANCISCO. See MARGALL, FRANCISCO PI Y.

PLAGUE. Captain R. H. Jackson published in 1901 his notes on plague in the General Plague Hospital, Belgaum, India. He considers the spread of the disease favored by overcrowding and deficiency of ventilation and sunlight, and finds that the poorer classes suffer most from its ravages. Infection occurs either by inoculation or by inhalation or by swallowing. He describes two forms of the dread disease, *pestis major* and *pestis minor*. *Pestis major* (the severe or ordinary plague) may be of one of the following five varieties: (1) Bubonic, (2) pneumonic, (3) septicæmic, (4) pyemic, or (5) local inoculation. He describes an average attack of ordinary bubonic plague substantially as follows: The period of inoculation lasts from 3 to 7 days. The period of invasion, or prodromal period, varies from 24 to 48 hours in length, and during it the patient suffers with chills, fever, weakness, lassitude, vertigo, headache, and vomiting. Bubo development follows, with staggering gait, tremulous speech, and great restlessness; a temperature of 104° F. or higher; a full pulse, averaging 130 to the minute; a dry, granular tongue covered with a yellow velvety fur, but with a red margin; an anxious and pallid face; constipation; and the enlargement of glands in neck, groins, or axillæ, constituting the buboes. Following the appearance of the buboes occurs a fall in temperature and pulse rate, and this generally on the second or third day of the disease. After a remission of a little over 2 days the fever ascends to 103° or 105°, at which point it remains for 7 days, during which time the bubo reaches its full development. After 10 days the temperature falls. Emaciation and exhaustion are extreme. The patient may now die of heart failure, in syncope; or of hemorrhage, of peritonitis, of jaundice, of hyperpyrexia; or he may recover after about 2 months' convalescence. Captain Jackson states that Haffkine's prophylactic serum has increased recoveries 15 per cent., besides being an unquestioned preventive. In 298 cases of plague treated at Belgaum Hospital there was a mortality of 61.4 per cent.,

or 183 deaths. In January, 1901, the plague had attained unusual severity in India, except in the central provinces. In Bengal, a weekly mortality of 2,500 was reported, partly due to starvation. In Russia, during the same month, what has been reported as "hunger typhus" was admitted to be plague. Many thousands perished in the Kirghiz steppes of western Siberia. Early in the year reports were rife of cases of bubonic plague occurring in San Francisco, which were denied by the local authorities. A commission appointed by the secretary of the treasury of the United States investigated the matter, and reported that 42 fatal cases of bubonic plague had occurred in San Francisco. During the 13 days' inspection made by the committee of the Chinese quarters in that city, 13 deaths occurred, of which 6 were proved to be deaths from plague. In March it was reported that 1,000 persons were dying daily of plague in India, while 10,000 had died in Peking in 6 weeks, and 1,770 cases, with 1,293 deaths, occurred in Bombay in one week. China, Cape Colony, Mauritius, and Russia were reported infected. The quarantine against Rio de Janeiro was raised by the Brazilian government on March 9, 1901, and the isolation hospital and disinfection stations were closed, the last death having occurred March 1, and the last new case having been received February 17. The total number of deaths during the Rio epidemic was 309, or 52.5 per cent. of the 589 cases. Early in April the United States consul at Canton, China, reported 10,000 deaths from plague in that city in the preceding 6 weeks. In the same month, from 2 to 17 new cases a day were reported at Cape Town, Africa. Report was received of plague in Manila, P. I., where it continued till October. In Bombay, 1,646 fresh cases and 1,360 deaths were reported in a single week. Western Australia, Karigagua (Russia), and Argentina, all were reported infected with plague. In June, 12 cases of plague, with 4 deaths, were reported at Oporto, Portugal. The disease was then raging at Cape Town. In July, several cases were reported at Zagazig and Minieh, Egypt; also heavy mortality among the rats. In Manila, the board of health offered 1½ cents for every rat killed. Late in July a stoker on the steamer *Hohenfels* was found suffering with bubonic plague when the vessel reached the port of New York from Calcutta. A few cases of the scourge were reported from Hong Kong in August; also a few cases among the native Egyptians in Port Said, Zagazig, and Alexandria. Two more suspicious cases were found in San Francisco. In November, Honolulu reported 23 cases of plague existing, with 2 deaths. Eight hundred instances of the disease were noted in Cape Town and its vicinity; also cases in Asunción, Paraguay, and in Rio de Janeiro. During 1901 the disease visited also England, France, Italy, Japan, Mozambique, Scotland, Straits Settlements, Turkey, Wales, Formosa, Madagascar, and Réunion. See INSECTS AND THE PROPAGATION OF DISEASES, and VITAL STATISTICS.

PLANETOIDS. See ASTRONOMICAL PROGRESS.

PLATINUM. The production of platinum in the United States in 1900 amounted to 400 ounces, valued at \$2,500, and was obtained entirely from gold placer deposits, chiefly in Trinity and Shasta counties, Cal. An important recent discovery is the finding of platinum in place in the bedrock. The location of these discoveries is in the Grand Encampment district of Wyoming, and also in the Similkameen district of British Columbia, where it has been found by J. F. Kemp in peridotite rocks. Traces were also observed in serpentine near Weaverville, Cal., as well as at Junction City, in the same county. The production of platinum in the Ural Mountains in 1901 amounted to 322 poods (11,628 pounds). Russia supplies about 96 per cent. of the world's production, and the value of that produced in the year mentioned was no less than 14,000 roubles (\$7,210) a pood (36.1112 pounds), while the cost of production did not amount to more than 4,000 to 7,000 roubles a pood. In 1901 the prices for platinum ranged from \$18 to \$20 an ounce for the pure platinum contents of platinum sand. The discovery of a use for osmium in connection with the new Auer incandescent electric light is a matter of great importance, as this metal is a common impurity of the American platinum, occurring as a constituent of osmiridium. The metal is worth \$6 to \$10 per ounce. Berthelot reports the finding of platinum letters on a metallic box in Egypt. They are undoubtedly native work, the age of the article being about 700 B.C. The discovery is interesting, as there has been some dispute as to whether platinum was known to the ancients.

PLATT, ORVILLE HITCHCOCK, United States Senator from Connecticut, is the author of the amendment to the bill for the recognition of the independence of Cuba, giving to the United States certain exclusive privileges in the island and maintaining a passive protectorate over it. (See CUBA, paragraph Relations to the United States.) He was born at Washington, Conn., July 19, 1827. After receiving an academic education he studied law, and in 1849 began practice at Meriden, Conn. In 1857 he became clerk of the State senate, and in 1861-62 was a member of that body. In 1864 and again in 1869 he was elected to the lower house of the

Connecticut legislature. He was chosen a United States Senator as a Republican in 1879. See **POLITICAL AND SOCIAL SCIENCE, AMERICAN ACADEMY OF.**

PLUMBING GAS. See **GAS, ILLUMINATING AND FUEL.**

POBIEDONOSTZEFF, CONSTANTINE PETROVITSCH, Russian statesman, procurator of the Most Holy Synod, one of the prominent members of the International Court of Arbitration, and leader of the reactionist element in Russia, was born at Moscow in 1827, and was educated at the government Institute of Law. After serving on the staff of the general secretary of the department of Moscow, he became, in 1859, professor of civil law at the university there, a position which he held until 1865. He was the tutor selected for the Grand Duke Alexander, who succeeded to the throne on the death of Alexander II., and he became one of the trusted counsellors of that monarch. Created a senator in 1868, he was made a counsellor of state in 1872, and Procurator-General of the Holy Synod in 1881. In this position he has proved himself one of the most active and unrelenting enemies of the Liberal movement, and the advocate of the strictest orthodoxy in the Greek Church, which exercises a great influence on Russian education. See **RUSSIA** (paragraph Riots).

POLITICAL AND SOCIAL SCIENCE, AMERICAN ACADEMY OF, founded December 4, 1889. Membership about 2,000. President, Leo S. Rowe, Philadelphia, Pa.; secretary, James T. Young, Philadelphia. The University of Pennsylvania publishes the bi-monthly periodical, the *Annals of the American Academy of Political and Social Science*. The academy holds periodical meetings at Philadelphia, at which political and social questions of current interest are discussed.

The fifth annual meeting of the academy, held at Philadelphia on April 12 and 13, 1901, dealt with the question of America's race problems. The following topics were presented: I. The Races of the Pacific: The Natives of Hawaii, Titus Munson Coan, A.M., M.D., New York City; The Races of the Philippines—The Tagals, Rev. Charles C. Peirce, D.D., chaplain U. S. Army; The Semi-civilized Tribes of the Philippine Islands, Rev. Oliver C. Miller, D.D., chaplain U. S. Army. II. Annual Address—The Causes of Race Superiority, Edward A. Ross, Ph.D., the University of Nebraska. III. The Race Problem at the South: Introductory remarks by Colonel Hilary A. Herbert, ex-secretary of the navy, Washington, D. C.; The Relation of the Whites to the Negroes, President George T. Winston, LL.D., North Carolina College of Agriculture and Mechanic Arts, Raleigh, N. C.; The Relation of the Negroes to the Whites in the South, Professor W. E. Burghard Du Bois, Ph.D., Atlanta University. IV. The Races of the West Indies: Our Relation to the People of Cuba and Porto Rico, Hon. Orville H. Platt, United States Senator from Connecticut; The Spanish Population of Cuba and Porto Rico, Charles M. Pepper, Esq., Washington, D. C.

The greatest interest centred about the annual address and the papers by Professor Du Bois, Senator Platt, and Mr. Pepper. Professor Ross, under the heading *Causes of Race Superiority*, discussed the following topics: Climatic adaptability, energy, self-reliance, foresight, and the possession of the value sense, the martial sense, inventive genius, stability of race character, and pride of blood. He considered that the Anglo-Saxon race was decidedly inferior to the so-called Latin races in respect to their ability to adapt themselves to new climatic conditions, and that all other races were in this regard inferior to the Mongolian. The settling of the tropics from northern Europe and from the United States he therefore considered to be extremely doubtful. In respect to race energy, the composite American race was held to be pre-eminently distinguished, this quality being largely developed and preserved by means of our democratic institutions. The American race is also distinguished for its self-reliance. Energy and self-reliance are of peculiar value during the dynamic period of the world's history while there still remain new countries to be developed up to the level of the more advanced nations. When this dynamic period has passed, the national qualities mentioned may easily prove a hindrance to adaptation to static conditions. Upon this point Professor Ross remarks: "It will take at least two or three generations to level up the industrial methods of continents like South America, or Africa, or Asia, as a Jamaica, a Martinique, or a Hawaii have been leveled up; and all this time that race which excels in energy, self-reliance, and education will have the advantage. When this furiously dynamic epoch closes, when the world becomes more static, and uniformism recurs, self-reliance will be at a discount, and the conditions will again favor the race that is patient, laborious, frugal, intelligent, and apt in consolidation. Then, perhaps, the Celtic and Mediterranean races will score against the Anglo-Saxon." The quality of foresight, economic prevision coupled with a high development of the sense of value appreciation, and with what may be called the impersonal quality in business, that is to say, the willingness to cooperate for profit with any one, even your worst enemy, Professor Ross declared was possessed in the highest degree by the Jews, Chinese, Parsees, Armenians, and in general the people about the Mediterranean.

In competition with these races, the Anglo-Saxon, in whom some of these qualities are deficient, may possibly be placed at a disadvantage. The possession of the martial traits and of a large amount of inventive genius were considered to be of decreasing value in the world competition. The increasing cost of war and the cosmopolitanism of genius and invention unite to lessen the importance of these characteristics, which have been of such great value in past struggles for supremacy. Pride of blood and a sense of race superiority tend to keep the race pure and to prevent degeneration by admixture. The chief moral traits of a winning race, however, are stability of character, perseverance, promise-keeping, and reverence for law. The economic development of the world now rests upon a credit basis, and the foundations of the credit structure are stability, security, and mutual confidence. The final question raised by Professor Ross was as follows: Is the Anglo-Saxon race able to survive all competitions and expand under all circumstances—*i. e.* when brought into competition with races on a lower plane of living? The question was answered by positing three alternatives: (1) The superior race may lower its standard of comfort and enlarge its numbers, which was considered unlikely; (2) the inferior race may raise its standard by increasing its numbers, which is even more unlikely; and (3) the inferior may supplant the superior race, which is relegated to the position of a ruling caste. This result would probably follow the unrestricted immigration of inferior races into the United States.

Senator Platt dealt with the political status of Cuba, with particular reference to the future relation of the island to the United States. He showed that the population of Cuba could be divided into five classes on the basis of political affiliations: (1) native-born Spaniards, (2) white Cubans, who were loyal to Spain, (3) white Cubans who preserved a neutral position, (4) white Cuban revolutionists, (5) colored people, who were mainly in revolt against Spain. "Between these different classes there is little of sympathy and much of distrust. Even the Spaniards and the autonomists do not affiliate, and at present there seems little prospect that there can be any political union among those who may be called the conservative people of Cuba. Their interests would lead them to unite, but their prejudices and suspicions forbid. Besides this lack of cohesion among the different elements of the population, there is strong probability that race questions may develop as between the whites and the colored people, who constitute one-third of the population of Cuba, and there is also the radical separation between the rich and well-to-do classes and the poor, which is at present intensified by the evident desire of the former that Cuba should be brought into close political relation with the United States," and their fear of the radical revolutionists, who are at present more active in politics than any other element. It will be seen, therefore, that the different classes of Cuban population have little in common, except a desire for liberty, as yet scarcely understood, and a pride of country. Whether these two common ties will be strong enough to insure an orderly, well-balanced, peaceful government remains to be seen. In view of the doubtful future of political stability in the island, and the strong probability of internal disturbance from the conflict of divergent interests, Senator Platt declared that the real hope of Cuba depended upon "the friendly advice and guidance and, if necessary, the assistance of the United States. . . . The revolutionary class will not at once abandon the idea that they alone are entitled to govern, and there will doubtless be more or less friction, contention, and disturbance; but as time wears on, it is to be hoped that out of confusion order may come.

"The hands of the United States are indeed partially tied. There is a limit beyond which it may not go, and yet within the legitimate limits which it has prescribed for itself it can do much. It may not interfere with the liberty of the people of Cuba to establish an independent government, republican in form and fact; it may, and must, for its own protection, and in the discharge of obligations from which it cannot escape if it would, see to it that the independence of Cuba shall not be overthrown, no matter from what quarter it may be assailed, and that life, property, and individual rights shall be as secure there as in the United States. . . . We must protect her against any demands which would impair her independence and against any internal dissensions which threaten the overthrow of republican government. . . . Our relations with Cuba will be unique. We may best express them by saying that we claim the right to be recognized as the guarantor of Cuban independence and of the stability of its government."

Mr. Pepper, in his paper upon the population of Cuba and Porto Rico, put forward two main propositions. He contended, first, that the natives of these islands were Spanish in language, institutions, and traditions. "A certain village in the far interior of Cuba was a hothouse of revolutionary agitation. I visited it at the close of the war, when the American military authorities were concerned over the threat of reprisals against the Spaniards. The Cubans professed to hate the whole race, and in those days, when long-restrained passion was finding vent, they thought they did

hate their own parent stem. They told me the two classes had nothing in common. Yet they had everything in common. The well from which the children were drawing water was of even more ancient origin than Spanish, for it was of the older Moorish construction known as the *noria*. That day there was a *fiesta*, or church holiday. The *baile*, or dance, which was a feature of the evening celebration, and which I witnessed, varied only a shade from the representation of the customs of Galicia, which I had seen at the leading Spanish theatre in Havana a few evenings previously. The music was an air which had floated over from the Bay of Biscay. The entertainment provided me at the *posada*, or inn, was such as I had read of in the pages of *Gil Blas*. The houses were like those in an eighteenth century print of *Don Quixote*. On a later day, mass was celebrated by the priest for the repose of the soul of Antonio Maceo and other Cuban insurgents, and the ceremonial was that of the Spanish Church in the Middle Ages. After seeing these things I did not give much heed to the Cubans' talk that they hated the whole Spanish race. Root and branch were too much alike for the hatred to endure."

This condition Mr. Pepper regards as in every way hopeful for the future of the island, because the Spanish peasantry is an excellent agricultural stock. Their love of freedom, their endurance, their native nobility, industry, sobriety, and hospitality render them in many respects equal to the people of the superior nationalities. Duplicity of their characters he considers to be mainly a manifestation of the negative resistance to centuries of oppression, and when treated fairly they are capable, given the proper inducements in the form of higher wages, of fair dealing. Mr. Pepper further contended that the Spanish inhabitants of Cuba and Porto Rico were capable of severe and continuous manual labor. "In Havana last winter an electric railway was being constructed, and much of the work had to be done under high pressure. It was in charge of a shrewd young American engineer, who at one time had 2,700 men under him. Everybody predicted his failure in completing the contract. Everybody was sure that the white and black Cubans and the Spanish peasants could not be relied on. The engineer did not argue the proposition. He knew human nature and he knew how to select good subordinates. They in their turn knew how to handle men. They urged the laborers by example and they set forth the inducements for hard work. The electric railway was finished on time. The young American told me that the labor capacity of the Havana individual workman was as high as the labor capacity of the individual workman in Pittsburgh. On that calculation he completed his contract." In conclusion the speaker contended that with proper guidance the future prosperity of Cuba and Porto Rico was assured. Tenacious of everything that has been his, the Spaniard transplanted to the tropics acquires greater resistance. Pushed, he becomes stubborn and unyielding. Persuaded, he may be led if too great violence is not done to his convictions. To lead and guide, not to drive, is the American solution of the race problem in the West Indies.

On October 31 and December 13, 1901, public meetings of the academy were also held in Philadelphia. The first was concerned with the outlook in the Philippines and was addressed by Dr. George F. Becker, of the United States Geological Survey, who has spent the last two years in the islands, and by Mr. Abrue, a native Filipino. Dr. Becker's conclusion was that the Filipinos were incapable of self-government on account of the diversity of races and lack of political training. Mr. Abrue admitted that the Filipinos were incapable of self-government, but contended that, while complete independence was out of the question, they should be given a limited form of government, and that this was proved by the successful working of the municipal and provincial governments already set up. He also thought that the natives should be given more voice in the central government, and that active participation in government would be the best possible schooling for the people. At the December meeting the policy of commercial reciprocity was discussed by Mr. John A. Kasson, special reciprocity commissioner. Peculiar interest attached to an authoritative statement of the need for reciprocity: "We have now one powerful nation (Germany) working against our agricultural exports, which are double the value of our manufactured exports. I do not believe there will be a combination of European nations arrayed against our products, but there is grave danger in the uniformity of these separate attacks. Our manufacturers cannot live if we do not have the markets of Europe open to us. We must get our manufactured surplus out of the country, and I regard the protection of export products as important as the protection of home products. At present we are a prosperous country, but no country can stand alone in its prosperity."

POLITICAL ECONOMY. The drift of political economy in the direction of becoming a true science was strikingly apparent during 1901. Works of theory are declining in number and favor, while concrete studies in special fields are occupying the time of the investigator. It is coming to be realized that an adequate description of the subject matter of a science must invariably precede the framing of any

valuable hypotheses. The most considerable work of the year on political economy, part 1 of Vol. II. of J. S. Nicholson's *Principles of Political Economy*, is avowedly of a descriptive character. The first part of the book is occupied with tracing out the different lines of economic progress in modern times. The different lines of inquiry are as follows: Increase in population; improvement in health, morals, and manners; cost of education and earning capacity; rise in the standard of living; diminution of pauperism and crime; increase in wealth; improvements in the means of production involving a decrease in "real cost" and an increase in productive power; and increasing happiness and well-being caused by a rise of wages and a decrease in the proportionate tribute paid to privilege or exacted by taxation. Under these different heads Professor Nicholson has brought together a large amount of material, the results of the work of special investigators in the different fields. Special chapter headings are: Progress and Money; Progress and General Prices; Progress and Relative Prices; Rent and Progress; Progress and Profits; and Progress and Wages. The last-mentioned chapter is especially noteworthy. It summarizes the results of wage investigation in France, England, and the United States, and gives an extended treatment of women's wages. The remainder of the volume is mainly concerned with a conventional discussion of public finance under the title, "The Economic Functions of Government." Mention should also be made in this connection of a new edition of Professor Richard T. Ely's *Outlines of Economic Theory*.

Turning now to discuss the practical work of the year 1901, we find a large number of monographs, to which only the briefest space can be allotted. Under economic history these books may be mentioned: *An Introduction to the Industrial and Social History of England*, by Edward R. Cheyney, professor of European history in the University of Pennsylvania; *A History of the Latin Monetary Union*, by H. Parker Willis, formerly professor of political economy in Washington and Lee University; *The Confederate States of America, 1861-1865: A Financial and Industrial History of the South During the Civil War*, by Professor J. C. Schwab, of Yale University, and *An Essay on Western Civilization in Its Economic Aspects: Medieval and Modern Times*, by Professor William Cunningham, of the University of Cambridge. Of these Professor Schwab's work is probably of the greatest present interest, since it presents for the first time a connected account of the financial policy of the Confederate States. The three principal subjects treated are: (1) The relations between the loan and tax policy of the South; (2) the monetary policy; and (3) the effect of the war in developing the manufacturing industries of the South. The treatment of the financial and monetary policy of the southern States is especially complete. Perhaps the most significant fact brought out by the author is that the Confederate government refused to make its paper money a legal tender, although the necessity for a forced circulation was far greater than in the North, which yielded to the arguments of the advocates of legal tender. The financial collapse of the South is clearly shown to have been the result of the blockade, and cannot be laid to the account of the financial management of the Confederacy. "The history of Europe, and especially of the United States, indicates that no statesman or body of statesmen could have devised means of carrying on the war without recourse to such arbitrary and disturbing fiscal devices."

In finance there may be mentioned *City Finances in the United States*, by Frederick R. Clow, and *The Taxation of Railways*, a report made to the Industrial Commission by Roswell C. McCrea; Professor B. H. Meyer's *Railway Regulation Under Foreign and Domestic Laws*, a report made to the Industrial Commission, may also be mentioned in this connection. Professor Clow deals with the budget, municipal administration, financial records dealing with the methods of keeping accounts, and notes on the history of municipal finance. Chapter III, dealing with the administration of municipal finances, is especially deserving of comment. This treats: The treasury, which collects, keeps, and disburses the public revenues; the comptroller, or auditor, who audits the bills, keeps a check on expenditures by comparing the amount of the appropriation for a given purpose with the sum of the expenditures for that purpose, and also acts as a check on other departments, particularly on the treasury, because all bills against the city, before being allowed, must receive his indorsement, while he may also countersign receipts given by the treasurer, count the cash of the treasurer, and receive statements from the banks of the city money on deposit; the revenue system; and the administration of debts. The book closes with a number of appendices presenting a considerable amount of material illustrative of municipal finance. Professor Meyer's discussion of railway regulation is unusually detailed. Its general divisions are as follows: I. Early railway charters. II. Later railway charters and general laws. III. Constitutional provisions relating to railway regulation. IV. Present general railway legislation. V. Foreign railway charters and important laws. VI. Prussian railways. VII. Views and opinions of railway men on the subject of railway regulation. The discussion of the

policy of Prussia is timely in view of the reviving interest in the question of public regulation of railway rates in the United States. The Prussian state has the right to approve all tariff schedules, including any proposed raising, lowering, or other changes of existing rates and the establishment of new schedules. The law also provides for special rates for certain commodities, such as iron, coal, salt, etc., and in times of distress the railways are required to introduce, temporarily, special rates on the transportation of grain, flour, etc., which rates are fixed by the emperor on recommendation of the federal council. The government also exercises the right to supervise the building, operation, and management of the roads and to employ them for the national defense in times of war. The report is strictly confined to the presentation of material, and the author seldom advances his own opinions. Under the head of labor may be mentioned: *Railway Labor in the United States*, a report made to the Industrial Commission by Professor Samuel McCune Lindsay, of the University of Pennsylvania, and *State Activities in Relation to Labor in the United States*, by William Franklin Willoughby, United States Department of Labor. Professor Lindsay's report makes a volume of over 300 pages. It is divided into four parts. Part I. treats of the general conditions of railway employment, especially of the relation of railway employment to other occupations. Part II. deals with the requirements of railway service; the qualifications for admission to the service, such as age, degree of skill, and previous education; general and technical education of employees, and the methods of promotion on different systems; problems of railway discipline, and the questions relating to blacklisting. Part III. treats of the organization of railway employees; the railroad brotherhoods and orders and the fraternal and beneficiary associations are described, and the attitude of railway corporations toward labor organizations and the arbitration of labor disputes is discussed. Part IV. deals with the relations between railway corporations and their employees. This subject is treated under the following heads: (1) Superannuation and pension systems; (2) employers' liability, and (3) safety appliances. *State Activities in Relation to Labor in the United States* is in the main a summary of labor legislation. A chapter descriptive of bureaus of statistics of labor is also included. Labor legislation is summarized under the following topics: (1) Employment bureaus; (2) the inspection of factories and workshops; (3) regulation of the sweating system; (4) the inspection of mines; (5) industrial conciliation and arbitration. The material is carefully organized, and sufficient explanation is presented to make it intelligible. On the subject of statistics, *Elements of Statistics*, by Arthur L. Bowley, lecturer in statistics at the London School of Economics and Political Science, may be mentioned among the most considerable volumes of the year. The main emphasis is on the interpretation of statistical method in terms of the higher mathematics. The book also treats of the scope and meaning of statistics, the general methods of statistical investigation, the application of those methods to the population census, the wage census, the work of the labor department, and the statistics of England's foreign trade.

Of works on commerce and industry the most important is *The Anthracite Coal Industry*, by Peter Roberts, Ph.D., of Yale University. This volume aims to give a complete description of the industry of anthracite coal mining, and, in so far as was possible within his limitation of space, the author has succeeded. The chapter headings are as follows: I. The Anthracite Coal Deposits: their geological structure; II. Developing the Coal Beds: on methods of mining; III. Capitalization; IV. Transportation; V. Mine Management and Inspection; VI. Employees and Wages; VII. Incidental Profits of Operators; VIII. Accidents; IX. Strikes; X. Unionism; XI. Reclaiming the Waste; and XII. Reflections. The author has gathered his information at first hand, and, while presenting the more important results of previous investigations, gives a large amount of material which was obviously collected on the ground. The chapters on Capitalization, Employees and Wages, and Incidental Profits of Operators are especially good, the last-mentioned containing an exhaustive presentation of the arguments on both sides of the company-store question. The book is enriched with a large amount of statistical material, which makes it valuable as a work of reference, and also by a large number of maps, charts, and graphic representations. In this connection *American Engineering Competition*, by an anonymous English writer, should be described. This volume is a compilation of articles resulting from an investigation made for the *London Times*. The book gives the best popular description of the processes of heavy iron and steel industry in the United States which has been published. The purpose of the writer has been to illustrate the superiority of American over English methods of production. With the same intention he has added chapters showing the superiority of American methods of transit and communication, and the superiority of our system of labor. His account of the handicap of unionism to English industry is especially interesting.

The economic journals have contained a number of articles worthy of mention. The most noteworthy theoretical papers are: *Industrial and Pecuniary Employ-*

ments, a separation of parasitical from useful employments, published for the American Economic Association by Professor Thorstein B. Veblen; and *Social Elements in the Theory of Value*, in the May number of the *Quarterly Journal of Economics*; and *The Economic Ages*, by Professor Giddings, in the *Political Science Quarterly* for June. The labor question has occupied a more prominent place in the reviews. Mr. Frank J. Warne presents an especially noteworthy description of the anthracite coal strike of 1900 in the *Annals* of the American Academy of Political and Social Science for January, and Professor E. L. Bogart describes the Chicago Building Trades dispute in the *Political Science Quarterly* for March and June. In the English *Economic Journal* especial attention is paid to the question of labor insurance. The principal papers on this subject are as follows: *Contracting Out from the Workmen's Compensation Act*, Mona Wilson in the March number, and *The Insurance of Industrial Risks, 1896-1901*, by Montague Wilson in September. Other papers on the general subject are: *The National Amalgamated Association of Iron and Steel Workers*, by Carroll D. Wright, in the *Quarterly Journal of Economics* for September; *Fraternal Beneficiary Societies in the United States*, by Professor B. H. Meyer, in the March issue of the *American Journal of Sociology*; and *Trades Unionism as Illustrated by the Chicago Building Trades Conflict*. The subject of money and banking is apparently not losing its interest. *The Stock of Gold in the United States*, by M. H. Muhleman, in the March number of the *Political Science Quarterly*; *Credit Currency and Population*, in the *Journal of Political Economy* for December; *Influence of the New Supplies of Gold*, by George E. Roberts, director of the mint, in the August *North American Review*; and *The Trust Companies*, by A. D. Noyes, in the *Political Science Quarterly* for June, may be mentioned among the concrete studies of the year. Under the heading foreign trade may be placed: *Iron and Steel in England and America*, by Jacob Schoellhof, in the *Journal of Political Economy* for December; *Commercial Position of the British Empire*, by Benjamin Taylor, in the September *Forum*; and *Western South America and Its Relations to American Trade*, by J. Russell Smith, in the November *Annals* of the American Academy. Under public finance may be mentioned *Philadelphia Street Railway Franchises*, by Clinton Rogers Woodruff, in the *American Journal of Sociology* for September; *Public Policy Concerning Franchise Values*, by George C. Sikes, in the *Journal of Political Economy* for September; Sanger, *The Report of the Local Tax Commission* (Great Britain), in the *Economic Journal* for September; and *Local Taxation in Germany*, by J. Row-Fogo, in the same magazine; *Direct Taxes and the Federal Constitution*, by Professor Charles J. Bullock, in the *Yale Review*, February, May, and August. On the trust problem, *The Tariff and the Trusts*, by Charles Beardsley; *The Genesis of the United States Steel Corporation*, by E. S. Meade; and *The Integration of Industry in the United States*, have appeared in the May, August, and November numbers of the *Quarterly Journal of Economics*, and *Monopolies and the Law*, by Professor J. B. Clark, in the *Political Science Quarterly* for September. In this connection should be mentioned a compilation of articles by the last-named writer entitled *The Control of Trusts*; and *The Billion-dollar Trust*, by H. W. Macrosty and S. G. Hobson, in the *Contemporary Review* for August and September. The subject of instruction in political economy has received much attention, largely due to the growing interest in commercial education. Professor R. M. Hoxey, in the September *Journal of Political Economy*, makes the most important contribution of the year to this subject, in a paper entitled *The Empirical Method of Economic Instruction*, in which he advocates a thorough study of the facts of economic life as a preliminary to any generalizations of economic laws as opposed to the present method, which, as he claims, saturates the student with ideas of normality before introducing him to facts which might conflict with those ideas. His paper is supplemented by an elaborate enumeration and classification of the processes and institutions of present-day economic society. Other papers on this subject are: *Economics in the Schools*, by Professor J. Lawrence Laughlin, in the June issue of the same periodical; *The Study of Economic Geography and The Principles of Economic Geography*, by Professor L. M. Keasbey, in the *Political Science Quarterly* for March and September; and *Relation of the College and University to Higher Commercial Education*, by Professor E. J. James, in the *Publications* of the American Economic Association. See ARBITRATION, LABOR; COOPERATION; ECONOMIC ASSOCIATION, AMERICAN; LABOR; POLITICAL AND SOCIAL SCIENCE, AMERICAN ACADEMY OF; TRUSTS; and other economic topics.

POLO. Increasing interest and skill in polo were evident in 1901. The Rumson Polo Club, near Red Bank, N. J., and the Great Neck Club, L. I., were new organizations. During the year the game was introduced at the United States Military Academy at West Point, and the government contracted for a score or more of ponies in the West. A feature of the summer was the increasing migration of players among the various clubs, since the Polo Association suspended from

application to certain summer teams the rule forbidding a player from playing on the team of a club of which he is not a member. The resulting composite teams, or "freebooters," afforded a number of interesting matches in the vicinity of Narragansett and Newport and elsewhere. The establishment of the junior championships, which were held for the second time in 1901, seems to have borne fruit in the improvement of the second-class men and in encouraging play on the part of the younger members. A team, which will be composed of Messrs. Foxhall Keene, Lawrence Waterbury, J. W. Waterbury, Jr., John E. Cowdin, and E. L. Agassiz as substitute, has challenged the English holders of the cup won by Sir John Watson's team at Newport in 1886. The match will be played at Hurlingham, England, in May, 1902.

The national championships of the United States for the Astor gold cup were in 1901 (September 2-13) held at Brookline, Mass., where they had a daily attendance of from 8,000 to 10,000 persons. Lakewood Polo Club defeated Myopia Hunt Club, 23-4, and Dedham Polo Club defeated Rockaway Hunt Club, 18-7½. Lakewood then defeated Dedham, 13½-3, in a hard-fought game marked by play of a scientific character seldom excelled in this country. The junior championships, preceding the senior events, were won by the Rockaway Club team, which defeated the Dedham team, 13-7. The club tournament events of the year, lasting from early March well into October, included innumerable cup contests, some of which are of scarcely less prestige than the national championships themselves.

POOL. A new trophy, replacing that won in 1900 by Alfred de Oro, of New York, under conditions that made it his personal property, was played for, together with the championship of the world, at Boston, February 18 to March 13, 1901. Frank Sherman, of Washington, won in 6 games straight, with De Oro second. The latter then challenged Sherman and won in a series of 3 games, 600 to 498, whereby he again became champion.

PORTER, FITZ-JOHN, major-general U. S. V., died at Morristown, N. J., May 21, 1901. He was born at Portsmouth, N. H., in 1822, and graduated at West Point in 1845. After serving in the Mexican War, he was (1861) made brigadier-general of volunteers in the Union army, and directed (1862) the siege of Yorktown, Va., as commander of the Fifth Army Corps. For services with General McClellan during the Peninsular campaign he was made major-general U. S. V. (1862). In the following year General Porter was court-martialed and cashiered from the service for alleged inaction at the second battle of Bull Run. During the twenty-three years following his dismissal he fought for reinstatement to his rank, which was granted to him in 1886. In his efforts to obtain vindication he secured the help of General Grant, who published (1882) a pamphlet, *An Undeserved Stigma*, in which he expressed his conviction that General Porter was innocent of the charge made against him. In civil life he was superintendent of the New Jersey State Insane Asylum from 1871 to 1875. He was police commissioner of New York City from 1884 to 1888, fire commissioner for a year, and served as cashier of the New York City post-office from 1893 to 1897.

PORTO RICO, the smallest of the Greater Antilles, lies east of Haiti, from which it is separated by Mona Passage. The area is stated at 3,606 square miles. The best harbor is that of San Juan, on the north coast; on the south the only harbors for vessels of ordinary draught are those of Ponce and Guanica. The population, according to the census taken by the United States government in November, 1899, was 953,243. Of this number, 589,426, or 61.8 per cent., were whites, while the colored inhabitants, including those of mixed blood, numbered 363,117, or 38.2 per cent.

Government.—Porto Rico constitutes a body politic, under the sovereignty of the United States, called *The People of Porto Rico*. But Porto Rican citizens are not vested with United States citizenship. The government of Porto Rico is administered by a governor and cabinet appointed by the President. The members of the cabinet, together with five other persons, constitute an executive council of eleven members, of whom at least five must be native Porto Ricans, and this executive council constitutes the upper legislative house of Porto Rico. The house of delegates, or lower legislative house, consists of thirty-five members, elected five each from the seven districts of the island. The executive council may, as the co-ordinate branch of the legislature, refuse to accept the acts passed by the house of delegates. The governor has the usual power of veto over acts passed by the legislature, while the Congress of the United States retains absolute power of veto over all acts of both the legislative and administrative branches of the insular government. The present governor of Porto Rico is William H. Hunt, of Montana, who was appointed by the President on July 23, 1901, to succeed Charles H. Allen, of Massachusetts, resigned. The appointment took effect on September 1, 1901.

Commerce.—The total value of the exports of merchandise to the United States from Porto Rico in the calendar year 1901 was \$6,958,677; the imports from the United States to Porto Rico in the same period amounted to \$8,746,651. For the previous year the exports of Porto Rico to the United States were \$3,078,648, while the imports from the United States were \$4,640,449. Thus, with the establishment of civil government in Porto Rico and the declaration of free trade between the two countries, the trade of the United States with Porto Rico more than doubled within one year. The principal items of merchandise shipped from the United States to Porto Rico during 1901 were as follows: Cloths, \$1,374,498; wearing apparel, \$423,013; all other manufactures of cotton, \$311,628; breadstuffs, \$864,958; iron and steel and their manufactures, \$684,618; provisions, comprising meat and dairy products, \$1,118,676; rice, \$1,565,412; fish, \$363,463; wood and manufactures of wood, \$415,985. Of the total shipments from Porto Rico to the United States in 1901, nearly five-sixths, or 5,513,457 out of a total value of \$6,958,677, were sugar. The only other considerable exports were unmanufactured tobacco, \$133,450, and manufactures of tobacco, \$653,431. Oranges were exported to a value of \$101,836, and straw and palm leaf to a value of \$114,646.

Agriculture.—Agriculture is the main—in fact, may be said to be the only—industry of Porto Rico. Of the total population of the island, as given in the census of 1899, 749,451, or 78.6 per cent., were returned as living in the rural districts, and practically all of these depend upon agriculture for a living. Sugar, coffee, and tobacco are the island's principal products, although a considerable quantity of fruit and vegetables of various kinds are also raised. The total acreage devoted to the three principal crops in the fiscal years ending June, 1900, and June, 1901, were as follows: Sugar cane, 80,044 acres in 1900 and 82,678 acres in 1901, or an increase of 2,634 acres; coffee, 180,301 acres in 1900 and 166,164 acres in 1901, or a decrease of 14,137 acres; tobacco, 15,339 acres in 1900 and 13,704 acres in 1901, or a decrease of 1,635 acres. At the same time the number of acres devoted to all other crops was 184,072 in 1900 and 201,815 in 1901, or an increase of 17,743. Thus the total of cultivated lands increased during the year from 459,756 to 464,361 acres, or 4,605 acres. At the same time the total acreage devoted to pasture lands decreased from 1,206,605 acres to 1,203,206 acres, or a net decrease of 3,399. The increase in the acreage devoted to the sugar crop is probably attributable directly to the new market for sugar in the United States, brought about by free trade between the two countries. This sugar crop has increased largely since the crop year of 1898-99, it being estimated at that time by Messrs. Willett and Gray at 53,826 tons; and though for the succeeding year it decreased, on account of the hurricane, to 35,000 tons, it increased in the following year to 80,000 tons, and was estimated for the crop year 1901-02 at 100,000 tons. The coffee industry has not yet recovered from the hurricane of 1899, and although much effort was made in 1901 to get out a large crop, severe storms seriously injured it, and the total crop only amounted, as estimated by Messrs. Willett and Gray, to between 60,000 and 70,000 bags. In previous years it has reached as high as 150,000 to 200,000 bags. The 1901 crop, moreover, was marketed at very low prices. Before the war the planters received from 20 cents to 35 cents a pound for coffee, while the average price in 1901 was about 12 cents to 12½ cents. The greater part of the crop was marketed, as usual, in Europe, where the coffee is especially liked and the consumers are willing to pay for it prices much higher than the prices for Brazilian coffee. Some apprehension was manifested in the island on the declaration of free trade with the United States, lest coffee, being admitted free to Porto Rico as it now is to the United States, might be used to adulterate the Porto Rican crop and so spoil its exclusive and "aristocratic" market. On August 15, 1901, Federico Degetau, resident commissioner for Porto Rico at Washington, filed a plea with the secretary of the treasury to allow imports of Brazilian and other coffee in Porto Rico to be taxed a duty of 5 cents a pound, as they had been under the Foraker act applying to Porto Rico. Mr. Degetau stated in his argument that the Foraker act placed the Territory of Porto Rico in the United States tariff system, but with the exception that imports of coffee to Porto Rico were to be taxed; and Mr. Degetau insisted that this exception should prevail even after free trade had been proclaimed between the United States and Porto Rico. The secretary of the treasury ruled, however, that the proclamation of free trade between Porto Rico and the United States necessarily abolished all Porto Rican import tariff duties which were not applicable to the United States. As stated by the commissioner of the interior for Porto Rico in his report for 1901, the tobacco planters experienced during 1900 much difficulty in selling their crop, even at the lowest prices, and for this reason the extent of the tobacco plantations decreased somewhat in 1901. This decrease, in the commissioner's opinion, would have been greater had it not been hoped that free trade between the United States and Porto Rico would offer better facilities for marketing their tobacco. Besides an increase in the general acreage of

minor crops, it should be added that in several places orange tree, pineapple, and vegetable planting has been started, especially by citizens of the United States.

Labor Conditions.—A monograph by Mr. Azel Ames in the *Bulletin* of the Department of Labor issued by the Treasury Department gives some interesting facts as to the condition of the laboring classes in Porto Rico. It is there stated that the great drawback to developing the agricultural possibilities of the island, and thus furthering the well-being of the people, is that the laborers are not in absolute need of anything more than they have. Hitherto, moreover, the staple crops of the island—sugar, coffee, and tobacco—have not been capable of paying more than the smallest wages, and practically no opportunities have existed for the peon to better his lot. With the recent exchange of the insular coinage with the United States currency, however, wages have been raised to 50 cents gold a day, and it is hoped that with the better methods of cultivation and with the larger capitalized concerns that may exploit Porto Rico agriculturally, the average wage can be still further increased.

Banks.—No United States national bank had been organized in Porto Rico up to the end of 1901, notwithstanding that the attorney-general rendered an opinion on June 2, 1900, holding that the following provision of the congressional act approved April 12, 1900, under which the territory of Porto Rico was organized, permitted the organization of national banks in the island: "The statutory laws of the United States not locally inapplicable, except as hereinbefore or hereafter otherwise provided, shall have the same force and effect in Porto Rico as in the United States." The only bank of issue in the island is the Spanish bank of Porto Rico, which was chartered on May 5, 1888, and the rights of which were recognized in the Treaty of Paris. The authorized capital stock of this bank is \$500,000, and the aggregate resources on June 29, 1901, were \$1,833,416. There is also in operation the American Colonial Bank of Porto Rico, chartered under the laws of West Virginia. This bank has been designated as the depository for United States funds in the island. Its capital is \$400,000, and the aggregate resources, including the United States bonds to secure public deposits, amount to \$1,349,888. There is also the Crédito y Ahorro Ponceño, with resources on June 30, 1901, amounting to \$630,738, and with a capital of \$120,000.

Education.—For the year 1901 the commissioner of education for Porto Rico reports that the average daily attendance in the elementary schools was 23,453, out of a total population of school age numbering 322,393. The enrollment during the year was 33,802, of whom 15,542 were white and 5,695 were colored boys, and 8,763 white and 3,802 colored girls. The number of schools open at the end of the year was 733, of which 132 were boys' schools, 71 girls', 528 mixed, and 2 night schools; the average number of schools open each month was 698. The number of buildings in use in schools was 120 in the towns and 387 in the rural districts, aggregating 507. There were 489 white male teachers employed at the end of the year, 250 white female, 42 colored male, 31 colored female, aggregating 812 teachers. During the year a summer normal school was opened at San Juan, and was attended by over 800 teachers. A large building for the normal school was placed under construction at Rio Piedras, and was opened in December. New school buildings to the number of 39 were completed and put in use, the teaching corps was reorganized, a system of agricultural schools was instituted giving practical instruction to about 1,000 students, and a high school was put in operation at San Juan. Of the teachers employed, 100 were American. The annual budget for the schools was increased from \$400,000 to \$501,000, and the schools are said to be now equipped with all necessary books and supplies. The free public library in San Juan has now 7,400 volumes. The school maintenance fund of \$501,000 allotted under the civil government was 25 per cent. of the entire insular budget, and is independent of the \$235,000 appropriated for school extension. For the year 1902 the commissioner estimates that 50,000 pupils will be enrolled; this will give perhaps an actual daily attendance of 35,000. In this event, the actual attendance will be a little more than one-tenth of the entire number of persons in the island of school age. While great advances have been made in the reorganization of the school system of Porto Rico, or rather in organizing an efficient system where formerly there was none, it is evident that, owing to the poverty of the peon class and of the inadequate means of transportation, a school system commensurate in size with the number of pupils to be educated can hardly be established in the island for several years to come.

In accordance with the recommendation of the governor, the legislature enacted a comprehensive educational law for the establishment and maintenance throughout the island of a system of free public schools, mainly of a primary grade. An elective school board was created for each school district, which, under the general supervision of the commissioner of education, was to have charge of the fiscal and business matters connected with the schools, increase from time to time the number of schools, and recommend to the commissioner the number and class

of teachers required. To support the schools, not less than 10 and not more than 20 per cent. of the insular revenues were to be appropriated. The school year was to last from eight to ten months in each year, and the commissioner was authorized to open a night school in any town upon the application of not less than twenty young men "unable to attend day school for justified reasons." Two other significant educational acts provided (1) that ten young men and ten young women should be sent yearly, at the public expense, to study for a term of four years at Hampton Institute, Va., or Tuskegee Institute, Ala., or some similar institution, where they might learn the arts and trades that would "best qualify them to assist in the improvement of the conditions of Porto Rico"; and (2) that twenty-five young men, poor but honest, and of "robust constitution," should be sent annually to study in the United States at the public expense for a period of five years.

Relations to the United States.—Several acts passed by the legislature seemed to attest the desire of the Porto Ricans to maintain close and cordial relations with the United States. By one of these acts \$10,000 were appropriated to exhibit the products of the island at the Pan-American Exposition; by another, the twenty-fifth day of July of each year was declared to be a holiday, to commemorate the anniversary of the first landing of American troops in Porto Rico. Provision was also made for sending chosen Porto Rican youths to the United States to be educated (see paragraph Education). In view of the fact that so large a percentage of trade is with the United States, Congress was petitioned to appropriate money to dredge out the channel of San Juan harbor, which is said to be shallow, tortuous, and dangerous for the navigation of large ships. The attention of Congress was further drawn to the advantage to the United States of establishing a naval station in Porto Rico, on account of the topographical and strategic situation of the island with regard both to the United States and to the proposed Nicaragua canal, and Congress was therefore petitioned to establish such a station.

Jury Trial.—In accordance with the governor's recommendation that trial by jury be instituted, but that until the people become acquainted with the system it be restricted to criminal cases, an act was approved on January 12, 1901, providing that any person accused of a crime, the penalty for which is death or imprisonment for two years or more, should be entitled, if he so desire, to trial by jury. By another act, approved January 31, rules of jury procedure were laid down, and it was there provided that to qualify a juror should be a citizen of the United States or Porto Rico, resident in the latter country for at least one year, conversant with the Spanish language, and possessing property in Porto Rico assessed to the value of at least two hundred dollars. No educational test was imposed.

Foreign Corporations.—By an act approved January 31, 1901, to go into effect immediately, it was directed that "all corporations or joint-stock companies organized under the laws of any State, or of the United States, or of any foreign government," which were doing at that time, or should in the future do business in Porto Rico, should file annually with the secretary of the island a copy of their charter and also a sworn statement showing the capital stock, and the amount of it paid in cash, and the assets and liabilities and the actual cash values thereof. Corporations were also required to consent to be sued in Porto Rican courts upon all causes of action arising against them in the island, and to indicate an agent, resident in Porto Rico, upon whom service of process could be made as valid on the corporation, and to file the written consent of the agent designated to such service.

Municipal Debt Limit.—By an act approved January 31, 1901, cities in Porto Rico of 10,000 inhabitants or more were authorized, with the consent in each case, however, of the executive council of the island, to issue bonds either for refunding existing debts, or for "constructing waterworks, sewers, public buildings, bridges, grading and opening streets, or other necessary public improvements." But the bonds issued could not be sold at less than par or draw more than 6 per cent. interest, and the principal on all bonds was directed to be redeemable in 10 years and payable in 20 years. Moreover, cities, large or small, were prohibited from becoming indebted in any manner or for any purpose, including existing indebtedness, in an aggregate exceeding 7 per cent. of the aggregate tax valuation of their property, and bonds and other obligations given by cities in excess of this amount were to be void.

Revenue Act.—By far the most important act passed by the Porto Rican legislature in 1901 was that prepared under the direction of Jacob H. Hollander, treasurer of the island, providing for a new system of taxation. Under the old Spanish régime there were, in addition to indirect taxes, a direct tax upon the income derived from urban and agricultural property, and a license tax on business and professions. In practice these taxes, both because of their nature and the mode of their collection, fell heavily upon the poor and lightly upon the rich. The indirect taxes consisted mainly, so far as concerned the insular treasury, of import duties

on common food products, and for municipal purposes they centred in taxation on the consumption of articles. The industrial and commercial tax bore particularly upon the small retail and manufacturing activities, which were generally in the hands of native Porto Ricans, while the financial, banking, exporting, importing, and distributive interests, controlled by Spaniards, were released for a nominal fee. In the collection both of license and of income tax there was much corruption in favor of those who were already strong enough to force further economic concessions. Property was assessed by the councils of sixty-six separate municipal districts, and though there was a central receiving board, unjust valuations were generally without redress. Notwithstanding, or perhaps because of, their injustice, these taxes, though variously modified by the American military authorities, did not suffice for the requirements of civil government, and the insular treasury was largely dependent upon the money collected under the act of Congress of April 12, 1900, levying, for the benefit of Porto Rico, import and export duties on Porto Rican goods to the extent of 15 per cent. of the Dingley tariff. But these duties, as directed by the congressional act levying them, would cease not later than March 1, 1902, after which time Porto Rico would be dependent upon her own resources. It was imperative, therefore, that a sufficient revenue act should be enacted and put into force as soon as possible. The Hollander act, approved January 31, 1901, repealed the Spanish taxes and laid instead (1) tax on real and personal property not to exceed 1 per cent. for both municipal and insular purposes, (2) excise taxes, and (3) a graded inheritance tax. The property tax was similar to those levied in the United States. Household furniture and wearing apparel, and land used for educational, charitable, or religious purposes were exempted, and also the working tools and crops of the farmers and planters. Mortgages on property—of which there were a great many—were considered as an interest in the property, so that the mortgage was made exempt from taxation up to the value represented by the mortgage. Property taken for unpaid taxes may be redeemed within three months of its sale. The inheritance tax is progressive, depending upon the relationship of the heir and the value of each separate bequest. The rates of the excise taxes are about one-half of those imposed in the United States. They are laid on the importation, manufacture, and shipment of proprietary medicines, playing cards, firearms, oleomargarine, matches, alcoholic liquors, and tobacco. Corporations have been treated substantially as unincorporated concerns, and are assessed upon the actual value of their invested capital. In order to make the assessment of values equitable and uniform, the whole machinery for this purpose is put in the hands of an insular supervisor, who appoints division assessors, by whom in turn the district assessors are nominated. Appeals from the assessments are heard in the first instance by select groups of division and district assessors, and on appeal by the insular executive council. While under the Spanish régime taxes were collected by a private company for a percentage of the receipts, they are now collected by bonded and salaried officials.

The merits of the Hollander tax law were widely discussed and its enforcement opposed by many of the islanders, but especially by the Spanish merchants, who before the United States' occupation had "evaded their lawful taxes with a success that put the American tax-dodger to shame." The destruction wrought by the hurricane of 1899, and the aid given by the United States to the islanders at that time, either directly or by the remission of taxes, seems in a measure to have made the Porto Ricans believe that, as stated by Mr. T. S. Adams, "through borrowing or by the bounty of the United States, the burden of taxation might be indefinitely postponed." An instance of this was a bill passed by the house of deputies, applauded apparently by the entire native population and having the approval of the five Porto Ricans in the executive council. This bill, which was defeated by the six Americans of the executive council, directed the government to loan the farmers and planters money to the amount of \$3,000,000, to be raised on bonds issued by the country.

Free Trade with the United States.—In little more than a month after the Supreme Court of the United States had held that Porto Rican imports and exports could be lawfully taxed (see UNITED STATES, paragraph Constitutional Status of Porto Rico), the Porto Rican legislature, acting in accordance with the terms of the Foraker act, under which the import and export duties had been laid, demanded that those duties should be removed and that the President should declare free trade between the two countries. The Foraker act directed that all duties should cease on March 1, 1902, but that they might cease earlier, or so soon as Porto Rico was able to pay her own bills. When, therefore, it was found that ample insular revenues were being collected under the Hollander act (see paragraph Revenue Act), the heads of departments decided on June 17 to call a special session of the legislature on July 4 to ask for free trade. The legislature, which met on that day, after setting forth that there had been "put into operation a system of local taxation to meet

the necessities of the government of Porto Rico," especially requested the President to declare free trade by proclamation on July 25, because that day had already been declared a legal holiday (see paragraph Relations to the United States) "to commemorate the anniversary of the first landing of American troops in Porto Rico." And on that day the President declared free trade to exist between the two countries.

Politics.—Reports from Porto Rico during 1901 appeared to indicate general good-will throughout the island and the cessation of any distinctive party opposition to the government. In 1900 there were two parties in the field: the Republican party, which in a general way indorsed the policy of the Republican party in the United States, and the Federal party, which indorsed Mr. Bryan's Kansas City platform, and logically, if unwisely, combated Governor Allen's policies and methods of insular administration. Although it was evident that the Republican party had a large majority in the island, Governor Allen expressly asked for and received the appointment of two Federals to the executive council, in order that there might be no claim made that the government was acting in a partisan spirit. Nevertheless, these two representatives resigned from the executive council on September 6, because they could not get the island divided into the election districts they thought proper. In October the Federal leaders instructed their followers to register their resentment by refusing to vote; and as a result the house of delegates, which met on December 3, 1900, and passed laws of such conservatism and appropriateness as to please all well-wishers of Porto Rico, was solidly Republican. The Federals then underwent a change of heart, and at a mass-meeting on June 16, 1901, attended by delegates from every district of the island, Munoz Rivera was deposed as party leader and Francisco Acuna was elected in his stead. On June 17 the convention sent a committee to Governor Allen to say that the Federals would in the future cooperate with his administration in all measures advancing Porto Rican interests; they were convinced of the governor's honorable intentions, if not wisdom, in the matter of Porto Rico; deprecated a continuance of political disagreements in small matters; and hinted that they regretted the resignation of the two Federals from the executive council and should be glad at the proper time to have alternate Federals appointed. Governor Allen responded in kind, and the meeting happily dissolved.

Territorial Officers.—The territorial officers in Porto Rico in 1901 were as follows: Governor, William H. Hunt; secretary, Charles Hartzell; attorney-general, James S. Harlan; treasurer, W. F. Willoughby; auditor, John R. Garrison; commissioner of education, Martin G. Brumbaugh; commissioner of the interior, William H. Elliott; United States district judge, William H. Holt; United States district attorney, N. B. K. Pettingill; territorial chief justice, José S. Quinones; associate justices, Louis Sulzbacher, José C. Fernandez, José M. Figueras, and Rafael Nieto y Abeille; resident commissioner to United States, Federico Degatau.

PORTUGAL, a constitutional monarchy of western Europe. The capital is Lisbon.

Area, Population, and Education.—The area, including the Azores and the Madeira Islands (*qq.v.*), is 30,038 square miles; the population, according to the census of 1890, was 5,082,257. The largest cities are Lisbon, 301,206; Oporto, 138,860; and Braga, 23,089. Emigration is large, amounting in the five years, 1894-98, to nearly 150,000. Religious toleration prevails, but the state church is the Roman Catholic, which embraces all but a small part of the inhabitants. (See paragraph History.) In 1890 there were 237,791 pupils in the public and private elementary schools. Normal schools have been instituted in several of the large towns, and there are a number of schools for secondary and technical education. The ancient University of Coimbra has about 1,400 students in its various departments. Elementary education is nominally compulsory, but the law is little enforced. In 1890, 79.2 per cent. of the population were illiterate.

Government; Army and Navy.—The executive authority is vested in the king, who is assisted by a ministry of seven members responsible to the Cortes. This, the legislative body, is bicameral, consisting of the chamber of peers and the chamber of deputies. The former is composed of certain bishops, royal princes, and members appointed for life by the crown; members of the chamber of deputies are elected by popular vote. Exclusive of Madeira and the Azores, Portugal is divided into four military districts. The army, consisting of 27 regiments of infantry, 8 of cavalry, 4 of field artillery, together with a number of batteries, companies of engineers, etc., numbers on a peace footing nearly 32,000 officers and men. The war strength is about 149,000 officers and men. About 10,000 troops are maintained in the colonies, the greater part being natives. The navy is being gradually strengthened and increased. During 1901 the only large ironclad, the *Vasco da Gama*, was overhauled and modernized, and the new cruiser, *Rainha d'Amelia*, was launched. Besides these, Portugal has about 90 vessels of all kinds, including 5 protected cruisers, 26 gunboats, and 45 torpedo boats. The naval force numbers about 49,000 men.

Finance.—The monetary standard is gold, and the unit of value, the milreis, worth \$1.08. For 1901 the total revenue was estimated at 52,188,125 milreis, and the expenditure 54,848,957 milreis. For 1902 the estimates are: Revenue, 52,269,000 milreis; and expenditure, 55,239,000 milreis. Of the revenue (1901), 24,294,050 milreis were from indirect taxes, 12,249,370 direct taxes, and 5,506,000 registration and stamps. The largest estimated expenditure was for interest on the consolidated debt, 19,954,094 milreis; the civil list amounted to 9,774,954 milreis, and the war expenditure to 5,950,754 milreis. Besides a floating debt of 44,653,414 milreis, the national debt in 1900 amounted to \$774,467,288.

Industries, Commerce, etc.—Of the total area, about 45 per cent. is waste land, of which, it is stated, 5,000,000 acres are susceptible of cultivation. The chief products are wine, wheat, rye, maize, oranges, onions, tomatoes, and potatoes. Sheep and goats are raised in the mountainous parts, and other live stock throughout the kingdom. The mineral products in 1898 amounted to 1,717,828 milreis. Copper, sulphur, coal, lead, antimony, and arsenic ore are mined, valued in the order named; and gold, silver, tin, and iron, are also found. In 1900 there were 512 mines yielding metallic ores, besides a number yielding non-metallic products. Cotton manufacturing is carried on, especially in the northern districts. About 4,000 vessels are engaged in the fishing industry; the value of the catch in 1898 was 3,717,606 milreis. According to a British report the imports for 1900 amounted to \$82,243,850, and the exports \$51,098,250. The principal exports are wine, which stands first; cork, live stock, copper, cotton fabrics, and olive oil. Trade is improving, especially with Germany. Hitherto Great Britain has furnished Portugal with about all the coal imported, but the United States is now beginning to compete for this trade. The Americans and Germans are also introducing hardware, machinery, and agricultural implements. In 1898 there were 1,464 miles of railway, of which 507 miles belonged to the state; 4,584 miles of telegraph lines; and 1,304 post-offices.

History.—Anti-clerical demonstrations similar to those in Spain broke out in various parts of Portugal in the early months of 1901, resulting on April 20 in a royal decree secularizing religious associations and orders and limiting their activities in the future to education and benevolences. The demonstrations, which were directed particularly against the Jesuits, were said to have had their origin in the means employed by that order in securing recruits for convents and monasteries. The feeling was particularly strong at Oporto, where the agitation was directed by an anti-clerical organization known as the Liberal Union. In that city theological students were mobbed, and it was necessary to provide them with special police protection. The agitation was strengthened by the fact that the native secular clergy generally made common cause with the Liberals against the members of the various orders, whom they have long looked upon as their rivals. The decree of the king stated strongly the necessity for a more complete separation of church and state in Portugal—a noteworthy sentiment from a Latin ruler—and in declaring for the secularization of the orders, provided that six months be given them for compliance. This action means the complete withdrawal of the Jesuits, Franciscans, and Benedictines, as well as several minor orders, and the disposal of their property, which is of considerable value. About 20 religious houses of various sorts have been closed.

A decree was published on August 20, 1901, modifying the electoral law. The reform had the effect of assuring minority representation in the electoral districts by substituting a general electoral ticket for each district in place of individual nominations in each subdivision of the district. The decree was the result of an arrangement between the premier, Senhor Ribeiro and Senhor de Carpo, the leader of the Progressists, in order to prevent the formation of a third party in opposition by Senhor Franco, the leader of a faction that had recently split off from the government party. The arrangement was considered a substantial victory for the Progressists, minority representation having long been one of their party measures; but at the same time it was looked upon as a stroke of diplomacy on the part of the premier which would do much to strengthen the Conservative or government party in its position. This view was justified by the result of the elections of October 6, when an increased government majority was returned.

PORTUGUESE EAST AFRICA. See EAST AFRICA, PORTUGUESE.

PORTUGUESE GUINEA, a colony of Portugal on the western coast of Africa between French Guinea and Senegal, has an estimated area of 4,440 square miles and an estimated population of 820,000. The colony includes the Bissagos archipelago and also the island of Boloma. According to the latest obtainable statistics (1900), the revenue was estimated at 56,655 milreis and the expenditure at 216,742 (the value of the milreis is \$1.08). The chief products are palm oil, wax, and rubber.

PORTUGUESE WEST AFRICA. See ANGOLA.

POSSE, Count ARVID, former Swedish premier, died at Stockholm, April 24, 1901. He was born at Schonen, Sweden, February 15, 1820, and was educated at Lund. From 1847 to 1849 he served as a judge of the Schonen court, and in 1856 was chosen a Conservative member of the upper house of the Swedish diet. He was elected to the lower house in 1866, and ten years later became president of the body. He was made premier in 1880, and during his administration introduced many reforms in the army and in matters of taxation. On account of party opposition, he resigned the premiership in 1883, and in 1889 became president of the supreme court of Sweden.

POTASSIUM CYANIDE. See **PHYSIOLOGY, CHEMICAL.**

POTATOES. The potato crop of the United States in 1901 was one of the smallest in the past 10 years, the average estimated yield an acre being only 59.9 bushels, as against 80.8 bushels in 1900 and a ten-year average of 78.7 bushels. Of the States having 50,000 acres or over planted to potatoes, the average yield in all except Maine and Michigan was below their ten-year averages. In Indiana, Illinois, Iowa, Kansas, Nebraska, and Wisconsin there was less than half a crop, and in Missouri less than a quarter of an average crop. There was also a heavy falling off in Ohio, Minnesota, and the Dakotas. The crop was fairly good in the Rocky Mountain States and on the Pacific coast. The most favored section was Maine. In Aroostook County, of that State, the acreage increased and the crop was the best on record, entire fields yielding 300 bushels an acre. The poor crops were largely due to dry weather. The average quality for the whole country was reported by the Department of Agriculture as 78.4 per cent., as compared with 88.1 in 1900 and 91.4 in 1899. The acreage and production in bushels in 1901, as estimated by the *American Agriculturist*, were as follows:

	Acrea.	Average Yield an Acre.	Production 1901.	Production 1900.
Maine	55,000	140	7,700,000	6,240,000
New Hampshire	20,000	80	1,600,000	1,900,000
Vermont	22,000	85	1,870,000	2,185,000
Massachusetts	25,000	65	1,625,000	2,619,000
Rhode Island	5,000	85	425,000	575,000
Connecticut	20,000	70	1,400,000	1,805,000
New York	330,000	72	23,760,000	29,480,000
New Jersey	42,000	70	2,940,000	2,925,000
Pennsylvania	190,000	75	14,250,000	15,416,000
Ohio	168,000	52	8,736,000	13,940,000
Michigan	187,000	77	14,400,000	18,060,000
Illinois	153,000	32	4,836,000	13,659,000
Indiana	110,000	28	3,080,000	8,510,000
Wisconsin	150,000	53	7,950,000	18,260,000
Iowa	170,000	27	4,590,000	12,870,000
Minnesota	118,000	56	6,608,000	12,376,000
Missouri	89,000	20	1,780,000	7,125,000
Kansas	105,000	24	2,520,000	11,284,000
Nebraska	164,000	34	5,576,000	17,658,000
South Dakota	61,000	50	3,050,000	5,000,000
North Dakota	37,000	90	3,330,000	3,811,000
Colorado	35,000	110	3,850,000	4,560,000
California	30,000	125	3,750,000	2,755,000
Oregon	23,000	140	3,220,000	2,737,000
Washington	21,000	115	2,415,000	2,600,000
Other States	490,000	65	31,850,000	36,750,000
Total.....	2,809,000	59	167,171,000	255,100,000

Ordinarily the production of potatoes in the United States is only about equal to home consumption; imports and exports are comparatively small, though there was an increase in the former in the latter part of 1901. The production in Germany in 1901 was 1,788,950,112 bushels, an increase of 297,695,400 bushels over 1900; but this was partly offset by an increase in the proportion of diseased tubers, estimated at 88,917,954 bushels in 1901, against 33,733,546 bushels in 1900. The preliminary estimate for the United Kingdom was nearly 300,000,000 bushels. The crop in Ireland, stated at 125,895,989 bushels, as compared with 68,761,728 bushels in 1900, was the finest in both yield and quality that that country has had for more than a quarter of a century. The production in Scotland was a good average, while in England and Wales it was under the average. The maritime provinces of lower Canada had good crops of potatoes; but in Ontario there was a shortage of nearly 16 per cent.

The Belgian production was 133,776,241 bushels; while in Russia, where there has been a large and steady increase in the growth of potatoes for the past 20 years, there was a heavy falling off in the total crop of 1901, in spite of an increased acreage of $4\frac{1}{2}$ per cent. The total crop of Russia was 879,710,734 bushels, against 962,267,310 bushels in 1900.

A striking illustration of what might be done in the humid regions of the United States in saving the potato crop by irrigation in a dry year, is furnished by experiments that have just been reported by the Wisconsin Experiment Station, as the result of several years' work. In 1900 the increase of merchantable potatoes by irrigation was 159.58 bushels an acre, and in 1897 and 1899 it was over 120 bushels an acre. The New Jersey Experiment Station reports an increase from irrigation of 36.4 per cent. in 1900.

POTTER, ELIPHALET NOTT, D.D., LL.D., American educator, died in the City of Mexico, February 6, 1901. He was born at Schenectady, N. Y., September 20, 1836, and graduated at Union College there in 1861. After studying at the Berkeley Divinity School, Middletown, he was ordained to the Episcopalian ministry in 1862, and held a charge at South Bethlehem, Pa., from then until 1869. From 1866 to 1871 he was secretary and professor of ethics at Lehigh University, being also for part of the same period (1869-71), associate rector of a church at Troy, N. Y. During his ministry he was active in the erection of three churches at South Bethlehem and two chapels at Troy. Dr. Potter was president of Union College (1871-84), of Hobart College (1884-97), and later, of the Cosmopolitan University, a correspondence institution. He declined the bishopric of Nebraska in 1884, preferring to remain in educational work. He was a son of Bishop Alonzo Potter, of Pennsylvania, and brother of Bishop Henry Codman Potter, of New York.

PRADO, MARINO IGNACIO, former president of Peru, died in Paris, May 6, 1901. He was born in Peru in 1826 and became active in the politics of that country during a revolution in 1865. At the head of this revolution he declared himself dictator, and a little later was elected president, holding office from 1865 until deposed by a similar uprising in 1868.

PRECIOUS STONES. See GEMS.

PRENTISS, BENJAMIN MAYBERRY, major-general, U. S. V., died at Bethany, Mo., February 8, 1901. He was born at Belleville, Va., November 23, 1819, and went west at sixteen with his parents and settled first in Missouri and later (1841) in Illinois. After serving as captain of volunteers throughout the Mexican War, he offered his services to the Union cause at the outbreak of the Civil War and was commission colonel of the 7th Illinois. He rose to the grade of major-general of volunteers and resigned from the service in 1863. General Prentiss was in command of a brigade at Shiloh, where, with three of his regiments, he was taken prisoner. His stubborn defense of the position assigned him by General Grant and the refusal to relinquish it without specific orders, resulting in his capture, gained for him the sobriquet of the "Hero of Shiloh." In his later life he was active in the Grand Army of the Republic, and was the last surviving member of the court-martial which tried and cashiered General Fitz-John Porter (*q.v.*).

PRESBYTERIAN CHURCH IN THE UNITED STATES OF AMERICA.

The church, now including 32 synods and 233 presbyteries, has 7,532 ministers, 7,779 churches, and 1,025,388 communicants and 1,058,110 Sunday-school members. Contributions for all purposes for the year aggregated \$16,338,376, of which \$12,152,088 was for congregational purposes, and \$1,252,159 was devoted to home missions, \$907,739 to foreign missions, \$79,078 to church erection, \$93,397 to educational purposes, \$274,415 to aid for colleges, and \$144,695 to freedmen's missions. The total of benevolent offerings amounted to \$4,111,953. The treasurer of the Twentieth Century Fund, which is applied to specific activities of the church, reported to the General Assembly receipts thus far of \$3,377,931. The Board of Home Missions carries on its work throughout the United States, including also Alaska, Porto Rico, and Cuba, with mission schools among the Indians, Alaskans, Mormons, Mexicans, mountaineers, and the people of Porto Rico and Cuba. In this field there are 1,342 missionaries and 425 missionary teachers. In the foreign missions of the church there are 636 churches, embracing 41,559 communicants, and 27 missions, 117 stations, and 1,182 out-stations, with 715 missionaries and 1,841 native helpers. Educational and medical work also are prominent features in this department. The Board of Relief now enrolls 931 families under its care. Among the freedmen the church helps to support 200 ministers and 263 teachers; there are 345 churches and mission stations with 20,000 members and as many Sunday-school scholars, and 18 boarding-schools, including Biddle University at Charlotte, N. C. The church has 13 theological seminaries and is affiliated with 38 colleges, some of which are under the direct control of the denomination.

The meeting of the 113th General Assembly in Philadelphia was among the most interesting in the recent history of the church. Additions to the "Form of Government" were made in regard to the licensure of candidates, salaries of pastors, ministers from other denominations, pastors emeritus, and vacant churches, and a constitutional rule was adopted as to candidates for the ministry. The assembly recorded its approval of the formation of an *Independent Synod of Mexico*. This Presbyterian body was organized at a meeting held July 6-9 in the City of Mexico, and includes four presbyteries, three of which had been in affiliation with the Presbyterian Church, North, and one with the Presbyterian Church, South. The newly established church, the outcome of a movement of some duration to organize a separate church in Mexico along the lines which were followed in the founding of that of Japan, is entirely independent of the Presbyterian churches in the United States, but will, of courtesy, report to these bodies. Among other matters which occupied the attention of the General Assembly was the proposed Permanent Judicial Commission, which, according to the plan reported by a special committee to the meeting, is to consist of 8 ministers and 7 elders elected for 3 years by the General Assembly, to pass upon cases appealed from the presbyteries and synods which the general body does not wish to try. In general interest, however, the importance of all other acts of the assembly was far subordinate to that of the revision of the creed. At the General Assembly of 1900, a committee was appointed to consider this matter and to ascertain the sentiment of the subordinate bodies of the church. An extraordinary degree of interest was evidenced throughout the year, and deliberation upon the subject gave rise to three well-defined parties: conservatives, who opposed any revision; moderates, who desired a few changes; and radicals, who stood for an entirely new Confession of Faith. Majority and minority reports of the tentative committee, which announced last year that returns from the local presbyteries indicated the desire of the church for some change in its creed, were presented to the General Assembly which finally adopted, as amended, the "majority" report, its decision being considered a victory for the "conservative" element in that the instructions embodied in the resolution provide for a supplemental statement in explanation of certain misunderstood passages of the Confession of Faith. The permanent revision committee is constituted of the old body and six new members, the retiring moderator of the assembly being succeeded as chairman by the present moderator. The resolutions of the General Assembly follow:

A. "We recommend that a committee, as provided for by the form of government, chapter XXII., section 3, be appointed by this Assembly.

B. "We recommended that this committee be instructed to prepare and to submit to the next General Assembly for such disposition as may be judged to be wise a brief statement of the reformed faith, expressed, as far as possible, in untechnical terms. The said statement is to be prepared with a view to its being employed to give information and a better understanding of our doctrinal beliefs, and not with a view to its becoming a substitute for or an alternative of our Confession of Faith.

C. "We further recommend that this committee be instructed to prepare amendments of chapter III., chapter X., section 3; chapter XVI., section 7; chapter XXII., section 3, and chapter XXV., section 6, of our Confession of Faith, either by modification of the text or by declaratory statement; but so far as possible by declaratory statement, so as more clearly to express the mind of the church, with additional statements concerning the love of God for all men, missions, and the Holy Spirit, it being understood that the revision shall in no way impair the integrity of the system of doctrine set forth in our Confession and taught in the Holy Scripture." The sections of the Westminster Confession noted above are, severally, those relating to the doctrines of predestination and foreordination, of infant damnation, and of total depravity, on the subject of taking oaths, and in regard to the aspersions upon the Pope. The revision committee, in session December 4-14 at Washington, D. C., finished before adjournment, a tentative statement of the revision by declaratory statement and appointed a sub-committee of five to whom was referred the subject of textual revision. As suggested, the work thus far accomplished is tentative and will be considered with the report of the sub-committee at a meeting of the entire committee on February 5, 1902, in Philadelphia. In 1902 the General Assembly will meet in New York City, May 15. Moderator of the General Assembly, Rev. Henry C. Minton, D.D.; stated clerk, Rev. William H. Roberts, D.D., LL.D.; 1319 Walnut Street, Philadelphia.

PRESBYTERIAN CHURCH IN THE UNITED STATES, SOUTH, was organized in 1864, of the union of two bodies which had withdrawn previously from the Presbyterian Church on account of differences arising over the slavery question. The two churches still maintain distinct organizations, though the fraternity which was reestablished some twenty years ago, was evidenced in the fall of 1901, when the synods of the two churches met in Lexington, Ky., to project a college for the higher education of women, to cost a half-million dollars. The Southern

Church has (1901) under its jurisdiction 13 synods and 79 presbyteries in which are comprised 227,991 communicants, with 1,485 ministers and 2,991 churches, and 2,238 Sunday schools with 29,797 officers and teachers and an enrollment of 147,610 scholars. These statistics show a uniform progress for the past year. Total contributions aggregated \$2,165,689, of which the more important items were: \$814,308 for pastors' salaries, \$795,510 for congregational purposes, \$134,745 for foreign missions, \$124,872 for local home missions, and \$87,553 for education. Sunday-school offerings amounted to \$92,066, a total exceeded to the extent of about \$6,000 by that of the various societies of the church. The church has a publishing house at Richmond, Va., controls several well-equipped educational institutions, and carries on a progressive work of colored evangelization. The foreign missions, which are maintained in Africa, Brazil, China, Cuba, Japan, Corea, and Mexico, include nearly 150 stations (26 organized churches), with 168 missionaries and 59 native helpers, and 3,271 communicants. Connected with this work are also 37 Sunday schools, and 6 boarding and high schools, with 887 pupils. The General Assembly of the church held its annual session, May 16-25, in Little Rock, Ark., the most important proceedings being concerned with creedal matters. The order of the assembly of 1900 providing for an explanation as to "elect infants" was rescinded, and tentative propositions for revision of this section of the creed were discouraged, the assembly adopting the report of the committee which made known its reasons and issued a statement as to the doctrinal position of the church. The meeting of 1902 will convene in Jackson, Miss. Moderator of the General Assembly, Rev. Leander M. Woods, D.D.; stated clerk, Rev. William A. Alexander, D.D., 501 College Street, Clarksville, Tenn.

PRESBYTERIANS, REFORMED. See REFORMED PRESBYTERIANS.

PRETORIUS, MARTINUS WESSELS, ex-president of the South African Republic, died at Potchefstroom, South Africa, May 19, 1901. He was born in Natal in 1827, the son of Andries Pretorius, a leader of the "Great Trek" (1836), succeeding his father as commandant-general of the Boers in 1852. He conducted the war against Makapan's tribe of Kaffirs; it is stated that he drove 3,000 Kaffirs into a cave, where they died of starvation. In 1860 he was elected president of the Orange Free State, and when the various small republics north of the Vaal coalesced in 1864, Pretorius left the Free State to become president of the new South African Republic. He was reelected in 1869, but resigned soon after on account of an unpopular arbitration agreement made in reference to territory claimed from the Baralong tribe on the west. After Mr. Kruger's elevation to the presidency (1883), Pretorius played only a small part in the republic's politics, being opposed to the war with Great Britain as a means of insuring the Transvaal's independence.

PREVENTION OF CRUELTY TO ANIMALS, AMERICAN SOCIETY FOR THE. The thirty-sixth annual report of the transactions of the society for 1901 shows that there were 54,712 cases of alleged cruelty investigated during the year, with the result that there were 606 arrests and prosecutions, 4,626 animals suspended from labor, 3,348 horses, mules, and other large animals, humanely destroyed, 90,480 small animals, homeless or disabled, also destroyed, and 541 disabled horses, etc., removed in ambulances. The society began the year with a balance in the treasury amounting to \$13,509.96, and received in bequests \$1,839.97, and from members' dues, donations, and other sources \$92,821.05, making the entire income and resources for 1901, \$108,170.98. The expenditure for the year amounted to \$105,806.20, leaving a balance to the society's credit at the close of the year of \$2,274.20. President, John P. Haines; secretary and treasurer, John Mason Knox, Madison Avenue and Twenty-sixth Street, New York City.

PREVENTION OF CRUELTY TO CHILDREN, NEW YORK SOCIETY FOR THE. during 1901 received and investigated 8,834 complaints resulting in the prosecution of 1,598 offenders, of which number 1,452 were convicted. During the year there were 5,327 children rescued from destitution and vicious surroundings, and 5,176 received food and clothing at the reception rooms of the society. At the request of city magistrates there were 597 cases investigated and proper disposition made of each case. President, Vernon M. Davis; secretary and superintendent, E. Fellows Jenkins.

PRIMITIVE METHODIST CHURCH OF AMERICA. This branch of American Methodism, which was introduced into the United States over seventy years ago, according to reports presented at the Fourth Quadrennial Conference in Scranton, Pa., October 9-16, has 68 ministers, 100 churches, with property valued at \$420,165, and 6,834 members, an increase of 745 during the last four years; 95 Sunday schools, with 1,629 officers and teachers and 11,288 scholars. Financial statistics for the last quadrennium show a total of \$9,158 for missions, and \$58,598 for building, improvement, and interest. The conference adopted measures for securing a new hymnal, indorsed the work of the Women's Home Mission Circle, and recorded

its sympathy with an incipient movement for union of non-Episcopal churches in this country, delegates from the Methodist Protestant Church being cordially received. The next general conference, in 1905, will meet at Newcastle, Pa. The Primitive Methodists maintain a publishing house at Fall River, Mass., and publish the *Primitive Methodist Journal*.

PRINCE EDWARD ISLAND, a province of the Dominion of Canada, having an area of about 200,000 square miles. The population, according to the census of 1901, was 103,259, against 109,078 in 1891. Capital, Charlottetown, with a population of 12,080 in 1901, against 11,273 in 1891. The schools, supported partly by government grants and partly by district assessments, numbered in 1900, 586 (against 580 in 1899), with a total enrollment of about 21,300.

Government and Finance.—At the head of the administration is a lieutenant-governor, assisted by an executive council. The legislative assembly consists of thirty members elected by popular vote. In the Dominion parliament the province is represented by four members in the Senate, and five in the House of Commons. The revenue and expenditure of the province for the fiscal year 1900 amounted to \$282,056 (\$282,678 in 1899) and \$308,494 (\$276,789 in 1899) respectively. The chief source of the revenue was the Dominion subsidy, \$181,932, and the largest item in the expenditures, public instruction, \$129,113. The gross debt was reduced from \$500,689 in 1899 to \$492,751 in 1900.

Fisheries, Commerce, etc.—The total value of the output of the fisheries for 1899 was \$1,043,645, of which the lobster catch represented \$484,459. The 240 lobster canneries employed in 1899 over 3,000 men, and the total value of fish exported from the province in the same year was \$541,585. The exports of the province for the fiscal year 1900 amounted to \$1,349,529 against \$1,289,659 in 1899. The imports for the same year were valued at \$502,565 (\$465,243 in 1899), of which \$159,748 represented the produce of the United States. The railway lines of the province owned by the government had a total length of 211 miles at the end of the fiscal year 1900. The deficit for the year amounted to \$46,227. One of the chief stipulations in connection with the island's entrance into the confederation in 1873 was that continuous communication should be maintained with the railway system of Canada; but not until 1888 was anything like a satisfactory service provided. In 1901 the provincial claims for better service resulted in an increase by \$30,000 of the annual subsidy granted by the Dominion government.

PRINCETON UNIVERSITY, at Princeton, N. J., founded in 1746. In 1900-01 the faculty numbered 101, with 15 curators and officers and 16 fellows additional. The student body for the same year numbered 1,354, distributed as follows: Graduate school, 117; academic department, 760; John C. Green School of Science, 477. The income for the academic year amounted to about \$275,000, the present endowment of the university now being about \$2,750,000. The gifts for the year amounted to \$227,477.34. The central library collection occupies the Chancellor Green Library Building; but this, having been outgrown, has been supplemented by a new building, having a capacity of 1,200,000 volumes. The library consists of 150,256 bound volumes, and 42,118 unbound periodicals and pamphlets. The additions for the year numbered about 6,000 volumes. The total of the libraries of the university, exclusive of pamphlets and duplicates, is 239,656 volumes. A new gymnasium is being built at a cost of \$275,000, most of which was subscribed by the alumni. See **PSYCHOLOGY, EXPERIMENTAL** (paragraph Princeton University).

PRIVATE BANKS. The following table prepared from reports made to the comptroller of the currency at different periods in 1900 and 1901, but approximating to June 30 of each year, shows the total number of private banks in 1900 and 1901, the total resources, and the total deposits:

STATES, ETC.	NUMBER OF BANKS.		DEPOSITS.		TOTAL RESOURCES.	
	1900.	1901.	1900.	1901.	1900.	1901.
New York.....	15	14	\$ 2,385,619	\$ 1,834,229	\$ 3,184,516	\$ 2,304,195
Pennsylvania.....	28	28	7,406,101	7,670,373	8,792,337	9,495,590
Maryland.....	6	9	229,653	941,277	463,735	1,751,510
Total Eastern States.....	49	51	\$10,001,373	\$ 10,445,879	\$ 12,440,588	\$ 13,551,295
North Carolina.....	25	17	\$ 1,218,328	\$ 874,618	\$ 1,802,062	\$ 1,581,755
Georgia.....	9	7	251,171	387,475	1,084,899	693,695
Texas.....	41	5	2,276,604	705,584	4,708,933	958,425
Arkansas.....	3	33	133,878	4,483,728	163,018	6,332,728
Kentucky.....	13	8	1,426,150	291,853	1,864,735	263,604
Total Southern States...	91	65	\$ 5,306,131	\$ 6,993,258	\$ 9,683,507	\$ 9,950,207

STATES, ETC.	NUMBER OF BANKS.		DEPOSITS.		TOTAL RESOURCES.	
	1900.	1901.	1900.	1901.	1900.	1901.
Ohio.....	71	92	\$10,019,076	\$ 22,649,205	\$ 12,117,758	\$ 25,826,082
Indiana.....	68	69	8,530,240	7,955,906	10,894,929	9,994,878
Illinois.....	185	157	12,944,333	16,297,996	16,829,522	20,138,489
Michigan.....	48	55	3,442,360	4,342,084	4,259,131	5,249,959
Wisconsin.....	127	138	10,431,449	11,679,996	12,257,519	13,579,611
Minnesota.....	47	49	3,221,816	3,450,402	4,257,875	4,572,369
Iowa.....	119	152	9,372,661	15,098,306	18,843,345	19,791,819
Missouri.....	90	24	8,097,417	7,621,699	9,400,775	10,649,378
Total Middle States.....	705	736	\$66,069,342	\$ 89,095,592	\$ 83,860,854	\$109,802,585
South Dakota.....	70	...	\$ 3,329,486	.....	\$ 5,008,718	.....
Montana.....	6	...	3,509,883	.....	4,096,312	.....
Wyoming.....	11	9	1,090,905	\$ 1,171,810	1,321,635	\$ 1,434,721
Colorado.....	13	17	584,982	3,220,563	795,517	3,914,166
Indian Territory.....	6	5	161,560	166,172	244,369	273,892
Total Western States.....	106	31	\$ 8,676,816	\$ 4,558,545	\$ 11,466,551	\$ 5,622,779
Washington.....	8	4	\$ 2,933,080	\$ 4,496,220	\$ 4,332,779	\$ 4,799,448
Oregon.....	2	2	87,061	165,567	184,450	275,477
California.....	19	21	1,629,687	1,755,270	2,798,391	2,976,474
Idaho.....	6	3	210,693	153,700	329,320	191,589
Nevada.....	1	1	24,364	49,408	49,477	74,529
Alaska.....	...	2	.....	338,758	.....	424,738
Total Pacific States.....	36	33	\$ 4,684,885	\$ 6,968,923	\$ 7,694,417	\$ 8,742,265
Hawaii.....	2	1	\$ 1,277,502	\$ 869,706	\$ 1,643,124	\$ 1,435,235
Total United States.....	989	917	\$96,206,049	\$118,621,903	\$126,789,041	\$149,104,346

For other banks in the United States, see articles NATIONAL BANKS, SAVINGS BANKS, TRUST AND LOAN COMPANIES, and STATE BANKS. For the resources of all banks in the United States, see article BANKS-BANKING (paragraph Resources of Banks in the United States).

PROFESSIONAL SCHOOLS. The following table shows the number of schools of theology, law, and medicine in the United States in the year 1899-1900:

	1899-1900.					
	Theology.		Law.		Medicine.	
	Schools. No.	Students.	Schools. No.	Students.	Schools. No.	Students.
Maine.....	2	38	1	43	2	163
New Hampshire.....	..	..	..	..	1	118
Vermont.....	..	..	..	..	1	191
Massachusetts.....	8	499	2	1,025	4	957
Rhode Island.....	..	..	1	58	..	..
Connecticut.....	3	191	1	195	1	135
New York.....	15	983	7	2,349	10	2,266
New Jersey.....	5	477	..	..	..	..
Pennsylvania.....	18	793	4	565	6	2,427
North Atlantic Division...	51	2,981	16	4,235	25	6,257
Delaware.....	..	..	..	..	..	..
Maryland.....	6	408	3	310	8	1,445
District of Columbia.....	3	145	6	757	4	483
Virginia.....	3	183	3	275	3	637
West Virginia.....	..	..	1	125	..	..
North Carolina.....	2	29	3	170	3	150
South Carolina.....	3	43	1	28	1	116
Georgia.....	2	129	4	81	3	412
Florida.....	..	..	..	..	..	..
South Atlantic Division...	19	937	21	1,746	22	3,292

1899-1900.						
	Theology.		Law.		Medicine.	
	Schools.	Students.	Schools.	Students.	Schools.	Students.
Kentucky	3	307	3	92	6	998
Tennessee	7	218	8	216	8	1,935
Alabama	3	46	1	51	2	247
Mississippi .....	..	..	2	79	..	..
Louisiana	1	10	1	75	2	427
Texas	1	6	2	181	2	296
Arkansas .....	..	..	1	18	1	123
Oklahoma .....	..	..	..	..	..	..
Indian Territory .....	..	..	..	..	..	..
<i>South Central Division...</i>	15	587	18	812	21	4,026
Ohio	12	423	5	616	13	1,569
Indiana	3	144	5	527	4	401
Illinois	15	1,237	10	1,168	15	3,353
Michigan	4	103	2	1,041	7	1,062
Wisconsin	4	316	1	230	2	260
Minnesota	8	292	1	528	3	503
Iowa	6	202	3	477	5	691
Missouri	7	589	3	401	16	2,256
North Dakota .....	..	..	..	..	..	..
South Dakota .....	..	..	..	..	..	..
Nebraska	1	19	2	200	3	313
Kansas	2	51	2	186	3	229
<i>North Central Division...</i>	62	3,376	34	5,373	71	10,646
Montana .....	..	..	..	..	..	..
Wyoming .....	..	..	..	..	..	..
Colorado	2	31	2	88	3	203
New Mexico .....	..	..	..	..	..	..
Arizona .....	..	..	..	..	..	..
Utah .....	..	..	..	..	..	..
Nevada .....	..	..	..	..	..	..
Idaho .....	..	..	..	..	..	..
Washington .....	..	..	1	44	..	..
Oregon	1	24	2	62	2	89
California	4	73	2	256	7	700
<i>Western Division</i>	7	128	7	450	12	992
Total—United States....	154	8,009	96	12,516	151	25,213

Besides the professional schools given above, there were also in 1900, 54 schools of dentistry, with 7,928 students; 53 schools of pharmacy, with 4,042 students; and 432 training schools for nurses, with 11,164 students.

A comparison of the state of professional education in 1900, with that of 1890 shows a decrease of 9 in the number of theological schools and of 252 in their attendance; an increase of 642 in the attendance of the law schools and of 1,435 in the attendance of the medical schools. The dental, pharmaceutical, veterinary, and nurse-training schools also show a total increase of 45 in the number of schools and of 2,257 in their attendance. A further comparison between the periods of 1890 and of 1900 serves only to emphasize the fact that the theological schools have only been slightly affected by the general progress of professional education during the last decade of the 19th century. Thus the slight increase of less than 5 per cent. during the decade in the attendance of the theological schools is contrasted with the increase of 63 per cent. in the attendance of the medical schools, 177 per cent. in the attendance of the law schools and 210 per cent. in the attendance of the schools of dentistry, pharmacy, veterinary medicine, and nurse training. The number of female students in 1900 was 181 in the theological schools, 151 in the law schools, 1,456 in the medical schools, 160 in the schools of dentistry, and 9,969 in the training schools for nurses.

PROTESTANT EPISCOPAL CHURCH. This body now consists of 60 dioceses and 21 missionary dioceses or jurisdictions within the United States and its possessions, and 8 missionary districts in foreign lands, including Western Africa, Cuba, China, Japan, Brazil, Haiti, Mexico, and European countries. Returns to the General Convention of 1901 indicate the whole number of clergy as 5,022, church

edifices, 5,948; parishes and missions, 6,781; and communicants, 743,622; and 46,940 Sunday-school officers and teachers, and 439,112 scholars. Contributions for the period of three years ending 1901 aggregated \$45,690,715, an increase exceeding \$6,000,000 over the total amount of the preceding triennium. In the year 1901, offerings for domestic and foreign missions reached a total of \$456,864, of which \$246,314 was for home missions. The church numbers among its charitable and educational activities, 70 hospitals, 50 orphan asylums, 83 homes, 116 academic institutions, 12 colleges, 16 theological seminaries, and 57 other institutions. In the year 1901 the church sustained notable losses in the episcopate by the deaths of William M. Barker, D.D., (*q.v.*) missionary Bishop of Olympia; Alexander Burgess, D.D., LL.D., (*q.v.*) Bishop of Quincy; Charles R. Hale, D.D., I.L.D., (*q.v.*) Bishop of Cairo and Bishop Coadjutor of Springfield; Abram N. Littlejohn, D.D., D.C.L., (*q.v.*) Bishop of Long Island; and Henry B. Whipple, D.D., LL.D., (*q.v.*) Bishop of Minnesota. The Venerable Frederick W. Taylor, D.D., was consecrated Bishop of Quincy, and Rt. Rev. Samuel C. Edsall, missionary Bishop of North Dakota, became Bishop of Minnesota. Other elections were made at the session of the General Convention (see below).

The General Convention, consisting of the House of Bishops and a representative House of Deputies, composed of four clergymen and four laymen from each diocese, is the supreme body of the church, passing laws for the American church, though it cannot make alterations "in the constitution, or in the Book of Common Prayer, unless the same has been adopted in one convention, and notified to all the dioceses, and afterward adopted in another convention." It holds triennial meetings, the next (1904) to be convened in Boston. The General Convention of 1901, in session October 2-17, in San Francisco, is notable for what it left undone rather than for what it accomplished in legislative matters, postponing to future conventions definite action as to the erection of provinces, the term of the presiding bishop, and the change in the legal name of the church. It accepted sections of a revised constitution, several dealing with the organization of the church for administrative purposes; it passed resolutions allowing the use in public of the marginal readings and permitting bishops to assume spiritual oversight over congregations not in union with the church, without insisting on the use of the Prayer Book; it established several new committees, notably those on the translation of bishops, the relations of capital and labor, and on conference with other religious bodies in relation to securing some uniformity in the matter of marriage and divorce; and it created seven new dioceses or missionary jurisdictions. Legislation on marriage and divorce, which attracted the most widespread and general interest, in the effort to impose on the clergy a rule against re-marriage of divorced persons, was defeated in the house of deputies. This question brought forth a warm discussion and after the house of bishops had passed favorably on the report of the preliminary committee, the proposed canon was rejected in the other house, objection, being made particularly to section 4, which prevented, even to the innocent party in the divorce, re-marriage excepting in case of reason antedating the former marriage when it would have been illegal *ab initio*. The resolution as to spiritual oversight by bishops of the church in the case of congregations so desiring, passed through various forms and finally was drafted so as to allow Episcopal control, provided that the congregations be not admitted to diocesan conventions until the Prayer Book is used, and the minister regularly ordained. The main proposition at issue, as brought by the so-called Huntingdon amendment (to permit the temporary use of other forms by congregations not in union with the church, but willing to accept spiritual care of an Episcopal bishop) is virtually relegated to the next general convention. Of the new dioceses or jurisdictions Western Massachusetts, Salina, Porto Rico, and Vieques, Honolulu, and the Philippine Islands, in the territory of the United States, and Cuba and Hankow, in foreign lands, those of Porto Rico and Vieques and of Honolulu are most notable, as they were transferred from the jurisdiction of bishops of the Church of England, the former for a monetary consideration of \$750. The cession of control in Honolulu will become effective April 1, 1902, on the resignation of the Anglican bishop. During the session of the convention interesting meetings were held on missionary problems and considerations for increased efficiency in administration discussed. At the thanksgiving service of the Women's Auxiliary, an offering of over \$104,000 was received. The episcopal letter, drawn up at the closing session of the General Convention, authorship of which is ascribed to Bishop Dudley, of Kentucky, was read in the churches on November 10; it is devoted primarily to a condemnation of individual license and immorality.

PRUSSIA. See GERMANY.

PSYCHICAL RESEARCH, THE SOCIETY FOR, founded in England in 1882 for the study of supernormal psychical and physical phenomena, had in 1901 5 honorary and 25 corresponding members, 30 honorary associates, and 865 members and associates. The president in 1901 was Oliver Lodge, LL.D., F.R.S. The membership includes many prominent men and women, both literary and scientific,

among whom are Lord Rayleigh, Sir William Crookes, Professor William James, of Harvard, Professor S. P. Langley, of Washington, and Mark Twain. The American branch of the society was founded in 1895 and has 506 members. In a circular issued by the president of the English society in December, 1901, it is stated that information is desired by the society about automatic phenomena, experimental telepathy, spontaneous telepathy, veridical phantasms of the dead, and the so-called physical phenomena of spiritualism; that is, "effects alleged to be produced on matter, such as the movement of objects without contact, which suggest some unknown physical force." The publications of the society are the *Proceedings* and a monthly *Journal*.

One of the most important contributions to the study of unusual psychical manifestations ever presented to the scientific world was made by Professor James H. Hyslop in the *Proceedings* of the Society for Psychical Research published in October, 1901 (*A Further Record of Observations of Certain Trance Phenomena*, Part XLI). Professor Hyslop had a number of sittings with Mrs. Piper, the well-known "medium," at which he was present, and a number at which he was not present, these latter having been conducted for him by Dr. Hodgson, the secretary of the American branch. At the latter sittings questions devised by Professor Hyslop were given to the trance personalities and the answers were taken down by Dr. Hodgson and sent to Professor Hyslop. It should be here said that Mrs. Piper has been studied by a number of members of the society for nearly twenty years, during which time no attempt on the part of skeptical persons has been successfully made to prove fraud of any kind against her. Professor Hyslop therefore at once dismisses the hypothesis that the communications apparently coming through Mrs. Piper are accountable in any way by dishonesty on her part or Dr. Hodgson's, and the question becomes then one of interpretation of facts. The facts of Professor Hyslop's sittings not previously published are as follows: A great number of communications were received in sittings occurring between December, 1898, and June, 1899, from the father, mother, brother, sister, two uncles, and a cousin of Professor Hyslop, and from the trance personality known as George Pelham, who has been the subject of previous reports. The messages of these deceased persons, though exhibiting the apparent triviality which is so customary in such communications, nevertheless have proved to Professor Hyslop the present existence of these personalities in some form and their ability to communicate with living persons in a way which, unsatisfactory as it may be to most people, is adequate proof of their persistence as distinct and recognizable personalities. It should be said in justice to Professor Hyslop that he is careful to state his conclusions in such a way as not to imply that he thinks that his own report disposes of all the objections to any spiritualistic hypothesis of trance phenomena in general. He says: "I think it will be evident without any doubt, whatever that the communicating intelligence claiming to be my father is either actually this person (with his mind somewhat confused and laboring under difficulties in expressing himself to me), or a very extraordinary personation of him that has acquired a knowledge of his experience ranging from an early period to his death, and including not only a proper appreciation of the matters in which he was most interested, but specific recollections of little possessions and peculiarities, some of which were entirely unknown to myself." Among the detailed facts given in the different sittings which are considered of great evidential value are the following: The names of the father and of several of the children were correctly given; some of the remedies used by the father in his last illness were mentioned, some of them being known to Professor Hyslop and others not; mention was made of a small brown-handled knife used by the elder Hyslop which the son knew nothing about, but which was subsequently found in the possession of a relative; phrases peculiarly characteristic of the father were used by the "spirit" purporting to represent him, such as "You had your own ideas," "You are not the strongest man," etc. The numerical relation between the true incidents just given and the false incidents, so numerous in most trance utterances, is as follows: There were 152 true incidents, 16 false incidents, and 37 intermediate. An "incident," in the sense used by Professor Hyslop, is illustrated by the following statement: "My aunt Susan visited my brother." This, however, may be resolved into four so-called "factors"—"aunt," "Susan," "visit," and "brother"—none of which is necessarily connected with any of the others in any causal or logical way. The numerical relation between the true and the false factors is as follows in the trances reported here by Professor Hyslop: "There were 593 true factors, 167 indeterminate, and 83 false, which shows even a greater proportion of truth than when only the incidents are considered. Certain facts concerning the conduct of the sittings should be understood before the reader is competent to form any opinion as to whether fraud is possible or not on the part of Mrs. Piper or of Dr. Hodgson, who makes all the arrangements for sittings with her. In the first place it should be repeated that this medium and even her personal possessions have for so long a time been under the close surveillance of

members of the Society for Psychical Research, whose object has been not to prove spiritism or telepathy, but rather to disprove the existence of these apparently abnormal facts, and to accept nothing as a fact which cannot be scientifically demonstrated. Furthermore, the sittings of Professor Hyslop were unknown to Mrs. Piper, even in her normal state, as he was introduced to her as Mr. Smith (with but one exception, which occurred years ago), and took, both before and during the sittings, extraordinary precautions not to be recognized by, or known to, her in any way. Thus he placed a black mask over his face before entering her house, spoke in an unnatural voice whenever he was obliged to say anything within her normal hearing, which was only twice, and during the trances sat behind her at her right, and just near enough to see her hand, by whose automatic writing most of the messages were received. Mrs. Piper's trances differ from those of fraudulent mediums (with whose methods Professor Hyslop is thoroughly acquainted), in that there is absolutely no mechanism of any sort connected with them. The only apparatus used was a pencil and a pad of paper, which were furnished by himself. He says: "In all cases of so-called independent slate-writing that I ever witnessed (which were clearly fraudulent), I was either in the darkness or the phenomena were produced out of my sight; the slate-writing was done nominally by a spirit directly and not by the hand of the medium, and I was not an eye-witness of the writing; but in Mrs. Piper's case, in addition to the daylight and absence of mechanical apparatus, like slates or cabinets, the writing is done visibly with her own hand, and on paper and with a pencil of your own furnishing. That is to say, we can actually see as much of the *modus operandi* of the 'communications' as we can see of any normal human act. Nothing is concealed from our view except the physiological processes that are equally concealed from us in our own writing as well as all other human affairs." He says further: "I should also indicate briefly the manner of making the record. Dr. Hodgson sat near the table on my right, where he could see the writing as it proceeded. This he copied, reading it in a low voice as an indication to the trance personality that it was intelligible, or sometimes with a tone of interrogation and doubt, which would be followed either by the word 'Yes,' sometimes written out, or assent by the hand, or by the repetition of a word or phrase not rightly read at first. He was unable to copy the whole of the automatic writing at the time, as it was necessary for him to record his own or my questions or statements made at the time and to describe certain mechanical features of the process not expressed in the writing, leaving room for the omitted portions of the writing afterward. When a question was to be asked or a statement made to the 'communicator,' Mrs. Piper's hand was spontaneously raised toward the mouth of the sitter, who addressed the hand, and it then immediately proceeded either to present the message to the 'communicator,' often extending itself out toward some 'invisible presence,' or to write out a reply. After the sitting was over, usually in the afternoon of the same day, Dr. Hodgson and myself went over the record together, completing the copy of the automatic writing. From this record typewritten copies were made and sent to the printer. The printed proofs have been compared first with Dr. Hodgson's copy, and then once more with the original automatic writing, so as to secure the utmost possible accuracy."

The two explanations for these phenomena, as studied by Professor Hyslop, that he takes into consideration, are the hypothesis that telepathy is responsible for the manifestations, and the other that a spirit of some kind is actually the communicator. The first alternative (and these seem to be the alternatives, if the supposition be accepted that fraud does not enter into the phenomena) is dismissed as being inadequate to account for the circumstances concerning the deceased which were correctly stated in the communications and which were not and could not have been known to Professor Hyslop; for example, occurrences that took place before he was born. That is, in order for the brain of Mrs. Piper to know these things by telepathy, it would imply that it was reading from the mind of Professor Hyslop impressions which could not from the nature of things ever have been received by it, or, if not read from his brain, the telepathic hypothesis demands that these impressions be taken from the minds of persons connected with him, but who were at the time of the sittings separated by a space of many hundred miles from the physical organism of the trance medium. In addition to this, telepathic hypothesis would require us to believe that Mrs. Piper's brain in the state of trance carried out a histrionic performance in the minute delineation of the personality of the deceased man, which seems incredible when it is considered that no such ability is exhibited by Mrs. Piper in her normal state. While the spiritualistic hypothesis is not claimed by Professor Hyslop to be absolutely proved, it is provisionally accepted by him for lack of a better. It will doubtless be urged by some that the results of so important a study of apparently supernormal phenomena should have been the means of giving some knowledge of the nature of a life after death. This contention has been met by him with the observation that the real question about life after death is its existence and not its nature. (Cf. *The Nature of Life After*

Death, Harper's Monthly, March, 1901.) Do the alleged communications of spirits prove the identity of the personalities they pretend to represent? As previously stated, Professor Hyslop does not try to maintain that his studies of the Piper case have done that, and denies the possibility of our knowing the *nature* of post-mortem existence, even if the genuineness of the communications is proved.

Possibly the attitude of the opponents of psychical research and the alleged results thereof is best expressed in the words of the late John Fiske (*Life Everlasting*, Boston, 1901): "Concerning such inductive evidence [of the presence of disembodied spirits], it may be said that very little has as yet been brought forward which is likely to make much impression upon minds trained in investigation. If its value as evidence were to be conceded, it would seem to point to the conclusion that the grade of intelligence which survives the grave is about on a par with that which, in the present life, we are accustomed to shut up in asylums for idiots. On the whole, the mediumistic ideas and methods are frankly materialistic, their alleged communications with the other world are through sights and sounds, and if their pretensions could be sustained the result would be simply the rehabilitation of the primitive ghost world. Their theory of things moves on so low a plane as hardly to merit notice in a serious philosophic discussion." This statement, however, was made ten months before the appearance of Professor Hyslop's exhaustive report on his sittings with Mrs. Piper, and is characterized by the same lack of serious attention to the proved facts of the case that is exhibited by so many of the prominent scientific men whose criticisms are heard with respect.

In justice to the psychical research workers and to Mrs. Piper herself it should be stated that she and they were misrepresented in an article in a New York daily newspaper in the latter part of 1901 (October 20). The article in question was largely advertised as a "Confession of Mrs. Piper," a word which naturally suggested that she had been conscious of dishonesty on her own part. The words in the article in question which might be susceptible of this interpretation were as follows: "The theory of telepathy strongly appeals to me as the most plausible and genuinely scientific solution of the problem. . . . I do not believe that spirits of the dead have spoken through me, when I have been in the trance state. . . . It may be that they have, but I do not affirm it." It will thus be seen that she herself threw no doubts upon the genuineness of the communications, and that her words can be taken only as an interpretation of the facts. It should be kept in mind, too, that Mrs. Piper is of all persons perhaps the least competent to form any opinion concerning the interpretation of the facts of her case, because to a great extent she is entirely ignorant of these facts, the matter of these communications having been kept from her, and she herself being unable to remember what she has said or written during the trance state. It does not, furthermore, apply to the work of Professor Hyslop. That the grade of intelligence which survives the grave is that of an idiot is not necessarily to be inferred from the reports of the sittings, when it is considered that the portion of post-mortem intelligence which can communicate with this world is but fragmentary, and that in all probability the mind of the communicator is in a state which closely approximates what we know as the hypnotic condition. This would account for the fragmentary character of the communications and their apparent triviality. Professor Hyslop assumes, to account for his facts, first, that the "spirit communicator" is in a condition of secondary personality (compare the paragraph on Dr. Prince's work, below); next, that Mrs. Piper, during her trances, is in a state of secondary personality (hers being passive, while that of the communicator is active); and, finally, that "there is some process of communication between these two conditions of secondary personality, whose *modus operandi* is not yet known. It might be *athanato-telepathic* in its nature. The evidence for this at present is insufficient. Or we might find an analogy in the combination of phonetic and electrical laws in the telephone, inasmuch as many of the confusions resemble phonetic errors."

Dr. Morton Prince, of the Boston City Hospital, contributes to the proceedings of the Society for Psychical Research a report of a case of multiple personality which has been under his observation for several years. The peculiarity of this case is that there are four separate personalities. Miss Beauchamp (pseudonym) came to Dr. Prince suffering from acute neurasthenia. As no improvement resulted from the ordinary remedies, he tried hypnotism as a last resource. The result was the removal of the pathologic symptoms and the development, partly spontaneously, of three other personalities at different subsequent times. These personalities come and go without any great regularity; but the most interesting as well as peculiar feature is that Dr. Prince discovered that two of the four are mutually exclusive parts of the original Miss Beauchamp, while the last is practically the reunion of the previously segregated portions of the mental content of the subject. Indeed, Dr. Prince uses the simile, in describing this case, of a white light passing through a prism and being analyzed into its constituent colors (the different selves of Miss Beauchamp), and finally being reunited again into the original white light. The

relation of one of the secondary personalities to the others is described by Dr. Prince as the emergence of the normal subliminal consciousness. The personality spoken of by Dr. Prince as B. III., and otherwise called Sally by the doctor and his patient, is considered by the former to be Miss Beauchamp's "subliminal." This seems the more likely, since the personality knows not only what is done by Miss Beauchamp in a waking state, a knowledge commonly possessed by the secondary personality, but knows also what is done by Miss Beauchamp when she is B. I. or B. IV. Dr. Prince draws the following conclusions from his study of this interesting case: "(a) The subliminal self may become developed into a true independent personality, which may be awake contemporaneously with the primary consciousness, or may be alone awake, the other personalities being asleep. (b) Other so-called and apparent personalities may be nothing more than the primary self, mutilated by disintegration. (c) The absence of knowledge and hence amnesia on the part of the primary self of the subliminal is dependent on the normal psycho-physiological arrangements. (d) The amnesia of one mutilated self for another mutilated self is due to disintegration and to a severance and rearrangement of psycho-physiological associations. (e) Theoretically any number of personalities are possible, according to the number and direction of the lines of cleavage. Each personality would depend on different combinations of different disintegrated pieces of the normal self. (f) Personalities may develop accidentally, as the result of accidental fracture without design, and not be the result of education. (g) The subliminal consciousness is not necessarily the equivalent of the hypnotic self. (h) Personalities may represent any different psychical compounds. One may be that peculiar group of psychical elements which is called the subliminal self, and another may be a disintegrated compound of the ordinary supernatant self. (i) Two or more personalities may have successive existences in time, or when one is the subliminal self they may be coexistent. (j) Personalities, including the subliminal self, may be hypnotized, and thus the personalities may become still further disintegrated."

PSYCHOLOGY, EXPERIMENTAL. In experimental psychology in America, the year 1901 was marked by no very widely spread activity, though a number of general books and papers on special topics will be noted in the following paragraphs. In several of the laboratories conducted by the best known investigators little or nothing new was done.

The keynote of the work that has appeared in the last few years and particularly in 1901, both in Europe and America, has been the recognition of the supreme importance of introspection on the part of the persons who act as subjects for experimentation. Formerly it was thought that if experiments were numerous enough general laws could be deduced on the ground that individual differences and errors would cancel each other. This is illustrated in the previous experiments on the association of ideas. Experiments in what has been called association time, that is, for the purpose of ascertaining the time that it takes a person to report in words an association of ideas, have required the subjects to react as rapidly as possible upon the given stimulus. Thus, for example, the word "English" was spoken by the experimenter or shown by him to the subject printed or written upon a card. The first English writer the subject could think of, e. g., "Thackeray," was then recorded, and the time elapsed, about half a second, was with certain modifications called the association time. The rapidity of thought necessitated by this method generally precluded the possibility of the subject's knowing how he came to say the word he did, as but little attention was paid to the train of thought in itself. The association was between the stimulus, whether auditory, visual, or otherwise, and a word spoken by the subject. The researches carried on by Mayer and Orth, *Zur Qualitativen Untersuchung der Association* (Qualitative Researches in Association), in the *Zeitschrift für Psychologie und Physiologie der Sinnesorgane* (Vol. 26, parts 1 and 2, May, 1901) and by G. Cordes in the Leipzig laboratory and published by him in Wundt's *Philosophische Studien* (Vol. 17, part 1), illustrate the painstaking care and acumen that are employed in modern psychological research work. It is also a curious fact that the latter paper, appearing in a periodical edited by possibly the greatest of European experimental psychologists, W. Wundt, should have as one of its most significant results the contention that the time of association cannot be measured, the measurement of association time having been one of the most prominent problems connected with association investigated by experimental psychology. Before Cordes's experiments in experimental psychology, the association of ideas had been understood to mean the bond or connection between the word shown or spoken (or other stimulus given by the experimenter to his subject) and the first word occurring to the subject. Cordes, on the other hand, studies the association between the first mental phenomenon observed by the subject and the next mental phenomenon observed, thus not accepting the so-called "stimulus" as a part of the association and confining his attention solely to the relations subsisting between two mental states which are more or less directly evoked by the stimulus in question.

Cordes also defines the only true sense in which the term "mediate association" may be used. In previous psychological discussion a mediate association was one observed between two ideas otherwise seemingly incongruous. The most familiar example is that given by Sir William Hamilton from his own experience. "After thinking of Ben Lomond he found himself thinking of the Prussian system of education, and discovered that the links of association were a German gentleman whom he had met on Ben Lomond, Germany, etc." (James, *Psychology*, Vol. 1, p. 578). Association was thus called mediate when it proceeded from one thought to another by steps, one or more of which were below the threshold of consciousness. As is shown by the minute study of Cordes, an association is mediate only by the persistence in consciousness of one or more elements or constituents of the mental content which forms the first member of the association—the "first mental phenomenon" above mentioned. This persisting element forms the link between the two members of the mediate association, *e. g.*, a feeling of pleasantness or unpleasantness is the element of the first phenomenon which persists in consciousness and constitutes the bond between it and the second phenomenon.

M. Ch. Fere reports a series of experiments on the variations of the excitability of certain muscles after great fatigue. His experiment consisted in recording by means of a delicate mechanism the contractions of the middle finger of the right hand (sometimes the left was substituted). The finger was thrust into a stall which in turn was connected by a wire with a pencil writing on a revolving drum. The subject sat in a comfortable position and moved his finger once a second until fatigue was so great that the motions stopped or nearly stopped and he was unable voluntarily to continue the motions. Then a sensation was given him, olfactory, visual, or cutaneous. A remarkable increase of ability to continue the contractions was almost uniformly observed as a result of agreeable sensations, while disagreeable sensations tended to make the work impossible. In a further series of tests made under uniform conditions, M. Fere found that "all excitations, whether pleasant or unpleasant, produce an increase of voluntary ability to work. This increase, whether primary or secondary, is accompanied by a feeling of efficiency which lasts while the stimulus lasts. In general the increase lasts only for a very short time after the stimulus stops. The fatigue which has been interrupted by the stimulus returns very rapidly when the feeling of efficiency has ceased." He concludes that external stimuli do nothing to increase the total amount of energy recorded in the experiments as a whole. The same experimenter using other tests found that effectiveness was increased by regular alternation of the right and left middle finger, and in a study of the comparative excitability of the two cerebral hemispheres he found the influence of external stimulation very marked in the case of tactile and olfactory stimuli acting upon the same hemisphere as that controlling the activity of the finger; but less noticeable in the case of visual stimuli.

Mlle. J. Joteyko, in experiments carried on at the psychological laboratory at the University of Brussels, investigated the question as to whether muscular fatigue, such as that exhibited in work with the ergograph, was caused by the giving out of the muscular fibers themselves or by the failure of the cerebral hemispheres to function. Her experiments consisted in producing in one hand a fatigue by means of the middle finger lifting a weight (ergograph) and then placing in the same hand a dynamometer, an instrument which is grasped and records the degree of pressure exercised by all the fingers. A comparison of these results with those of the left hand, which had not been fatigued by the ergograph, was made the criterion of the participation of the nerve centres. She found that the ability of 10 persons out of the 18 that were her subjects, to do work with the dynamometer were not affected by the fatigue of the right hand caused by the ergograph; but, on the contrary, exercise of one kind increased slightly the ability to perform work of another kind with the same hand. The eight others lost 20 per cent. of their strength by reason of the fatigue caused by the ergograph. It is concluded that the ergograph, while it totally exhausts the powers of the muscles of the middle finger to move, does not thereby take away the power of the hemisphere to initiate the movement of some sort. It has been found by other observers that the amplitude of each muscular contraction is an element of the work done on the ergograph separate from the number of the contractions; but does not affect the amplitude. The sum of the amplitudes expressed in centimetres when divided by the number of contractions gives a result that has been called the "fatigue quotient." From her experiments the relations of this fatigue quotient have been formulated by Mlle. Joteyko in the following law: "The fatigue quotient, which is the ratio between the total amplitude of the contractions (in centimetres) and their number in tracing made by the ergograph and which in similar conditions is numerically constant for each individual (personal quotient), undergoes a gradual decrease in the curves which are made with

regular intervals of rest not long enough for the complete restoration." This law shows that the fatigue of voluntary movements acts first upon the peripheral organs because the first of the two factions making the quotient (amplitude) is a function of the work of the muscles, and the second (number) is a function of the work of the voluntary nerve centres. Fatigue is thus shown to be a means of protection for the organism, for before the nerve centres have had time to become exhausted the cessation of work on the part of the nerves acting directly in the muscles prevents further action on the part of the cerebral hemispheres. The relation between the muscular power measured by the dynamometer and intellectual work has been shown in experiments conducted by M. J. Claviere to be as follows: Severe intellectual effort for two hours has resulted in a diminution of physical power, while after rest there has been an increase.

J. J. van Biervliet reports in the *Revue Philosophique* (October, 1901) the results of experiments upon right and left handedness. He finds that the persons who are commonly called ambidextrous are really to be called left-handed; in other words that there are really no ambidextrous people. That there are truly ambidextrous people would imply that there are some whose nerves are just as finely developed on one side of the body as on the other. He found a number of persons whose upper limbs were equal or nearly so, and he carefully examined them to see which side was the more sensitive. His results show that asymmetry is the general rule even in psychic functions. It has been asserted that the normal man has the left eye a few millimetres higher than the right and the left ear higher and further from the middle of the top of the nose.

Dr. P. Haenig, in an article, *Zur Psychophysik des Geschmacksinnes* (On the Psychophysics of the Sense of Taste, *Philosophische Studien*, Vol. 17, part 4, page 576, November 26, 1901) reports the results of his researches with seven subjects on the localization of the various taste sensations in the oral cavity, the qualities of the sense of taste, and the intensity of the sensations of taste. He finds nothing to prove the existence of a separate alkali, metallic or electric taste quality, these sensations being so complex as not to admit of accurate analysis. He finds that the upper surface of the tongue is divided into two parts, a zone of sensitivity to taste around the edge of the tongue with a tasteless region in the middle, the line between them being not very well defined. Sweet is perceived on all parts of the taste zone, best at the tip, but least clearly at the back of the tongue. Bitter is perceived on all parts of the taste zone; but best at the back of the tongue and least at the tip. Salt is almost equally well perceived on all parts of the tongue; best about the edges of the upper surface, and least at the back. Sour is perceived in all parts of the taste zone; most clearly, however, on the middle of the side.

Clark University.—A large number of investigations in many lines of psychological research were carried on during 1901 at Clark University. Among those published during the year may be mentioned those of W. S. Small on *The Mental Processes of the Rat*; of A. J. Kinnaman, *A Comparison of Judgments for Weights Lifted with the Hand and Foot*; of E. B. Huey, on the *Psychology and Physiology of Reading*; of N. Triplett, on *The Educability of the Perch*; of N. Triplett and E. C. Sanford, *Studies in Rhythm and Meter* (all in Vol. 12 of the *American Journal of Psychology*, 1901). Other researches carried on, but not published, were upon certain illusions and upon the mental operations of monkeys. Mr. Huey found that in reading ordinary print in current periodicals the eye moved from three to six times for each line, only 80 per cent. of the distance from one end of the line to the other being traversed as a general thing, the eye fixating first on a point nearer the beginning of the line than those last fixated are to the end of the line. For instance, in the first line on this page the word upon which the eye is first directed is not the first word in the line, but the second or third, and the eye after moving four or five times is directed to a word near, but not on the end of the line, from which it jumps back to the second or third word of the next line and so on. The average position of the word first looked at in the line is nearer the beginning of the line than that of the word last looked at is to the beginning of the line. The average forward movement in reading occupied about four one-hundredths of a second, while the return to the point first fixated near the beginning of the line took 50 to 60 thousandths of a second. The times during which the eye was at rest reading, i. e., pauses between the abrupt forward movements, were nearly a fifth of a second. The average number of words read at each pause of the eye varied from 1.50 where the line was 121 mm. long to 3.63 where the line was half that length, thus showing that in short lines more words are taken in with one glance of the eye than in long lines. Where the line was as short as 25 millimetres, several lines could be read without moving the eye at all. As to methods of reading, the experimenter finds that the greatest number of his readers were of the so-called "audito-motor" type, who while they read seem to themselves to be speaking and hearing the words. An actual lip movement was, however, observed in a very small number of the cases.

The conclusion drawn is that this imagery of lip motions with the auditory imagery of the words is the normal concomitant of silent readings, and that both are to be expected even where the subject claims to have no motor imagery. Purely visual reading, that is, silent reading without accompaniment of motor or auditory imagery has not been found by Mr. Huey, though this is not taken as a proof that words may not be read in that way. Mr. Huey offers interesting suggestions concerning the possible improvement of the manner of printing so as to make reading easier. He believes that "there is possible an arrangement of printed reading units which will greatly lessen the work of the eyes and considerably lessen that of the mind, and which will increase the speed." See paragraph Wesleyan University.

In the field of animal psychology Mr. W. S. Small reported the continuation of his researches in the mental processes of the rat. His experiments consisted in placing a rat at the entrance of a maze, made of appropriate size, but in detail like the famous Hampton Court maze. In the centre of the maze was placed food, and the animal was allowed to become thoroughly hungry before the trial was made. Every feature of the rat's progress from the outside to the centre of the maze was carefully noted, and the results are shown to have a bearing on the subject of animal intelligence in general. Interesting facts concerning the methods and senses most used by the rats in finding their way into the centre of the maze are, that they are believed not to have used the sense of smell and the sense of sight but little. This latter fact was inferred because blind rats found their way into the maze with no less facility than those with perfect vision.

Columbia University.—A large number of experiments of much interest in educational psychology were made by Professor E. L. Thorndike, of the Teachers' College of Columbia University, and Dr. R. S. Woodworth, of the New York University Medical College, on the influence of improvement in one mental function upon the efficiency of other functions (*Psychological Review*, vol. 8, pp. 247, 384, 553). Experiments were performed by a number of subjects well trained in psychological work, in estimating in square centimetres the areas of rectangular pieces of paper. A certain proficiency was acquired by the subject in making these judgments. It would naturally be supposed that after training in the mental estimate of rectangles he would be more efficient in judging the other shapes—triangles, rhomboids, circles, etc.—than before his training; but this was not found to be the case. "To sum up the results of this experiment, it has been shown that the improvement in the estimation of rectangles of a certain shape is not equalled in the case of similar estimations of areas of different shapes. The function of estimating areas is really a function-group, varying according to the data (shape, size, etc.). It has also been shown that even after mental standards of certain limited areas have been acquired, the function of estimating with these standards constantly kept alive by noticing the real area after each judgment is a function largely independent of the function of estimating them with the standards fully acquired by one or two thousand trials; but not constantly renewed by so noticing the real areas. Just what happened in the training was the partial formation of a number of associations. These associations were between sense impressions of particular sorts in a particular environment coming to a person in a particular mental attitude or frame of mind, and a number of ideas or impulses." Other experiments showed similarly that there is not an increased efficiency in a given function because the subject had previously been trained in a function as similar to it as was the judgment of the areas of rectangles similar as a mental function to the judgment of like areas of different shapes; or like shapes but of greater or less areas. In addition to the tests with areas of small pieces of paper, other tests were made with the mental functions employed in judging similar weights of different shapes, and functions involving attention, observation, and discrimination, such as marking on a printed page all the words having in them both s and e, i and t, s and p, etc.; marking verbs; marking other parts of speech; marking Latin verbs, prepositions, adverbs, and conjunctions; marking words of a given number of letters; marking logarithms containing certain pairs of numbers. The general results of all the tests here mentioned was as stated above, namely, that the training of one mental function does not necessarily involve any greater facility in performing other mental functions which are so similar to it as almost to be called by the same name. It is believed that this has a direct bearing upon the question as to the educational value of many of the subjects taught in schools.

Cornell University.—In number and importance of experiments whose results were published in 1901, the laboratory of experimental psychology, Cornell University, is one of the most noteworthy of the American laboratories. Among the researches given out in that year may be mentioned: *A Color Illusion*, by Miss M. F. McClure; *The Perception of Visual Form*, by Miss Louise F. Hempstead; *A Method of Mapping the Retinal Circulation by Projection*, by R. M. Ogden; *An Analytical Study of the Memory Image and the Process of Judgment in the Discrimination of Clangs and Tones*, by Dr. G. M. Whipple; and *A Genetic Study of Rhythm*, by Mrs. C. R.

Squire (all in *American Journal of Psychology*, vol. 12, 1901). The most important publication was *Experimental Psychology: A Manual of Laboratory Practice* (Vol. I. Qualitative; part 1, *Instructors' Manual*; part 2, *Students' Manual*; together, two volumes, N. Y., 1901). Dr. Whipple's experiments were as follows: His six subjects were given auditory stimuli in the shape of tones produced by an Appunn tonometer. Three stimuli were used, the subjects hearing one tone (without over-tones) and after it either the same tone again with an interval varying in the different experiments from 2 to 60 seconds, or another tone 8 vibrations higher or lower in pitch. The subject's judgment, which was the object of study in this research, was then to be exercised in stating whether the second stimulus was higher or lower in pitch than the first, or the same as the first. The general results of the experiments were that the lengthening of the interval between the two sounds heard by the subject "increases the number of mistakes in judgment, and that the correct judgments are most numerous when the second sound is the same as the first." The two chief problems of the research: (1) What is the course and the nature of the tonal memory image? and (2) What is the nature of the judgment process? are studied with careful consideration of the dependence of the results upon the nature of the individual subject's train of thought, and to make this clearer a short musical history of each subject is given. The most typical form of the judgment process may be characterized as follows: (a) The sound given arouses a widespread reaction, which includes adjustments of the organs of hearing, feelings of pleasantness or unpleasantness, visual, verbal, and other associations often of considerable vividness of detail and organic sensations of various kinds. These supplementing processes help to give the auditory image an individuality; their nature, prevalence, and distinctness depending, however, on the constitutional tendencies of the observer. The auditory image does not emerge to consciousness until a short interval has passed, when it decreases in intensity, its clearness decreasing less and its quality or timbre least; and vanishes entirely from 30 to 60 seconds after the sound has ceased. The waning of the strictly tonal memory does not, however, imply a corresponding loss of the other imagery or feelings mentioned above. When the second sound is given the judgment is at once made as to whether it is the same or higher or lower than the first, though there is sometimes the feeling of difference which does not contain the judgment of higher or lower. There is a definite correlation between the quickness of the judgments and their certainty. Supplementary experiments were made to test further the effect of long practice upon a single interval and to compare more fully the effect on the judgments of a change in quality or timbre of the sounds given. In the latter it was found that the practice gained is of a special variety and does not increase the efficiency in the judgment process for other sounds very similar in quality. Compare paragraph Columbia University.

Mr. W. C. Bagley, assistant in psychology at Cornell, reports results of experiments, and other forms of investigation begun by him at the University of Wisconsin on the correlation of mental and motor ability in school children (*American Journal Psychology*, vol. 12, p. 193), the experiments being dynamometer tests, rapid movement of Morse telegraphic key, tracing a pattern for steadiness of motor co-ordination, and tossing marbles at a self-registering target for accuracy and constancy of voluntary movements; and for amplitude of involuntary movements a Jastrow automatograph. The results show that "under the conditions of the investigation and with the children that were tested, there is a general inverse relation between motor and mental ability, those who are the 'brighter' pupils and those who have the quicker reaction times being as a rule deficient in ability, while those who are best developed physically, who are the strongest, who have developed 'motor' control to the greatest extent are generally deficient in mental ability. This rule, however, was found with the children tested to have numerous individual exceptions, and of varying validity at different periods of development. There seems to be little direct relation between mental ability as represented by reaction times and mental ability as represented by class standings, except that excellence in either of these directions is apt to be accompanied by a deficiency in motor ability. There is a gradual increase of motor ability with age. The increase in mental ability is not so well marked. In general the boys slightly surpass the girls in motor ability, while the reverse obtains in mental ability. Regarding cranial capacity as indicated by the head girths we notice a significant trend toward an inverse relation between mental ability and head girth."

Mrs. Squire investigated the perception of rhythm and the ability to produce different kinds of rhythm in vocal utterance on the part of a number of school children in Germany and the United States; and she made a careful research upon seven subjects to find the effect, if any, of differences of pitch upon rhythm. The experiments on children showed interesting differences between the Germans and the Americans in the greater tendency of the former to associate pitch and rhythm; while her laboratory experiments with adults showed that no constant relation is to

be expected between pitch and rhythm. Other points investigated by her were concomitant motor phenomena, respiration, etc., and the effect of chorus reading upon tempo. One of the most important results of the research of Mrs. Squire is that the previous division of all persons into rhythmical and unrhythmical is not to be accepted. "Numerous degrees in the perfection of motor rhythm have been shown, as well as indications that there are the same gradations in the perception of rhythm from that of a young child who does not perceive rhythm except as a series of movements, and these loosely connected, to the older children whose perceptions were very complex, involving not only numerous bodily rhythms, but auditory and affective rhythms as well, all fusing to a total perception, a unitary impression arising from the manifold of sensation." Other conclusions are that the perception of rhythm seems to be a phenomenon characteristic of audition and movement, that the sensations must follow each other regularly and not less frequently than one every second (the favorable rate between .3, and .6 being that of certain bodily rhythms); that stress of temporal intensity or pitch is a means of comparison, and that introspection does not warrant the position of "two forces, one directed forward and the other backward, or the pressure of alternate feelings of strain and relief." Affective elements cannot be taken as fundamental to rhythm, its perceptual nature being attested by the gradual growth of rhythmical ability and perception and by the absence from the pneumographic curve of rhythm of the well-known affective curve. "The æsthetic effect of the rhythm is not due, as Wundt remarks, to a summation of the sense feelings; but arises from the manner of connection of these sensations. One arrangement of intensities is pleasanter than another because it increases the unitariness of the total impression and its efficacy for reproduction. The various possible arrangements of the objective factors, temporal, intensive, and qualitative, have a greater or less æsthetic value according to the approximation of the resultant impression to a unitary character. Here is another instance of a pleasantness arising from the perception of unity in the manifold."

Princeton University.—No researches were completed in the psychological laboratory at Princeton during 1901, though the following were under way: (1) On tests for the classification of individuals according to sense types; (2) on the quantitative fluctuations of memory; (3) on the perception of symmetry of different sorts. Professor Howard C. Warren is the associate editor of the *Psychological Review*, and compiler of the *Psychological Index*, an annual volume containing all the titles of psychological books, pamphlets, and articles appearing in all languages during the year; and Professor J. Mark Baldwin, co-editor of the *Review*, is editor-in-chief of the *Dictionary of Philosophy and Psychology*, the first volume of which was published in New York in 1901.

University of Cincinnati.—A psychological laboratory was established at this university in 1901, with Professor Charles H. Judd as director, and an equipment costing \$1,000, including anatomical models and instruments of precision. Professor Judd completed in 1901 researches on the effects of practice on the perception of illusions.

University of Iowa.—The psychological laboratory at this university was installed in 1901 in a new fire-proof building, where eleven rooms are devoted to the department. The laboratory has an annual appropriation of \$500. Among the researches carried on in 1901 were experimental studies in visual illusions by Miss Mabel Williams, a series of psychological tests on 800 school children conducted by Dr. Howe-Pugh, and an experimental study of the individual psychology of music by Mr. G. S. Dick. Professor C. E. Seashore has completed two new pieces of psychological apparatus, (1) the Psychergograph, introducing a new method of measuring mental work, and (2) an instrument for measuring the pitch of the voice in singing. Professor G. W. T. Patrick, the head of the department, published in 1901 a study of the *Psychology of Profanity* (*Psychological Review*, March). He points out that swearing is an instinctive reaction incident upon the inhibition of action of some sort, and that as such it is a positive factor in the evolution of morality. It has been stated by an eminent British authority on insanity that in aphasia, or the loss of speech, the last words to be lost are the oaths, a circumstance which points to the primitive nature of this form of asseveration, and the same writer maintained that one of the first foundation stones of civilization was laid by the first man to swear at his fellow instead of knocking him down and killing him when angered at him. Professor Patrick shows the safety-valve nature of profanity, and concludes by pointing out that the reasons why profanity is immoral are only because "advancing civilization bids us evermore inhibit and repress, and secondly because of the unfortunate but inevitable connection between profanity and the sacred names of religion."

University of Missouri.—A separate chair of psychology has been established in this university, and a psychological laboratory will be equipped. Among the publications of this department are a *Contribution to a Psychological Theory of Music* (*University of Missouri Studies*, I.) by Professor Max Meyer.

Wesleyan University.—Professor Raymond Dodge and Mr. T. S. Kline report interesting and valuable experiments upon the rate of the movements of the eye in reading (*The Angle Velocity of Eye Movements, Psychological Review*, Vol. 8, p. 145, March, 1901). The motions of the eye in reading and their rate is of great importance in the psychology of reading (compare paragraph Clark University). Previous attempts at measuring eye movements had been made by Volkmann, Samansky, and Huey. Professor Dodge photographed on a moving sensitive plate the reflection of a piece of white cardboard on the cornea of the eye as it moved from side to side. The results by this method were found to be very accurate, and it is of practical value since it causes less discomfort to the subject than do the older methods. The results of Professor Dodge's experiments by this new method show a curious fact, that in the motions of the eyes in reading or in other similar work both eyes do not move together. "Apparently the two eyes neither start their movements nor end them at the same instant." It is pointed out that this may account for the fact before observed in studies of the eye in reading, that it perceives little or nothing during the time it is actually in motion; but all ocular perception is accomplished by the eye when it is at rest, these periods of rest being, however, large as compared with the great velocity of the eye movement.

Among the more important books on psychological topics published in 1901 are: *A Dictionary of Philosophy and Psychology*, edited by James Mark Baldwin (New York); Hobhouse, *Mind in Evolution* (London); Titchener, *Experimental Psychology: A Manual of Laboratory Practice* (New York); W. H. R. Rivers, *Reports of the Cambridge Anthropological Expedition to Torres Straits* (Vol. II., *Physiology and Psychology*, London); Calkins, *Introduction to Psychology* (New York); Thorndike, *The Human Nature Club* (New York); Mason, *Hypnotism and Suggestion in Therapeutics* (New York). The following, among other important works, have appeared in German: Marbe, *Experimentelle Psychologische Untersuchung ex über das Urteil* (Leipzig); Thumb and Marbe, *Experimentelle Untersuchungen über die Psychologischen Grundlagen der Sprachlichen Analogiebildung* (Leipzig). Of those published in French the following are among the more important: Paulhan, *Psychologie de l'Invention* (Paris); van Biervliet, *La Mémoire* (Paris); Vaschide and Pieron, *La Psychologie du Rêve* (Paris); Lemaitre, *Audition Colorée et Phénomènes Connexes* (Paris).

PUBLIC HEALTH. See **HYGIENE** and **VITAL STATISTICS**.

PUBLIC SCHOOLS. See **SCHOOLS**.

PYRITE. The production of pyrite in the United States in 1900 amounted to 204,615 long tons, valued at \$749,991, which is an increase over 1899 of 17 per cent. in quantity and 38 per cent. in value. The imports in 1900 were 322,484 long tons, which was an increase of 20 per cent. over 1899. On account of the increased demand for pyrite there was renewed activity in the mining of the Canadian deposits. The world's production of pyrite in 1899 amounted to 927,313 long tons and came chiefly from Spain and France. Pyrite is used largely in the manufacture of sulphuric acid.

PYTHIAS, KNIGHTS OF, a large fraternal organization, founded in 1864 at Washington, D. C. For the United States, Canada, Mexico, Cuba, Alaska, and Hawaii, there are reported 6,860 subordinate lodges, with a total membership of 516,944. These numbers practically represent the order in the United States, for the combined membership in the other countries mentioned is stated to be only 5,792; of these, 4,882 are in Canada. The grand lodges number 54. The life-insurance branch has 66,561 members, representing an endowment of over \$116,000,000. The total benefices paid up to the beginning of 1901 amounted to \$15,560,181. Supreme chancellor, Ogden H. Fether, Janesville, Wis.; supreme keeper of records, R. L. C. White, Nashville, Tenn.

QUAKERS. See **FRIENDS, SOCIETY OF**.

QUARTZ. See **FLINT**.

QUEBEC, a province of the Dominion of Canada, has an area of 347,350 square miles. The population, according to the census of 1901, was 1,648,898, as compared with 1,488,535 in 1891, showing a larger absolute increase than any other province in the dominion, and a relative increase of a little less than 11 per cent. Capital, Quebec, with a population of 68,834 in 1901, against 63,000 in 1891. Education is compulsory between the ages of 5 and 16, and the schools are maintained partly by local taxation and partly by local grants. At the end of 1900 the total number of Roman Catholic educational institutions was 4,980 (4,900 in 1899), of which 4,659 were under the control of municipalities, and 328 independent. The Protestant institutions in the same year numbered 966 (979 in 1899), of which 954 were under the control of municipalities and 12 independent. The total number of schools of both denominations and their enrollment in 1900 were respectively as follows: Elemen-

tary schools, 5,819, 199,422; model schools, 567, 81,042; academies, 156, 30,789; normal schools, 4, 342; Roman Catholic classical colleges, 19, 5,837; Protestant colleges, 3, 75; universities, 4, 2,095. During the period of 1896-1900 the number of educational institutions of the province increased from 5,903 to 5,959; the attendance, from 303,619 to 322,761; and the expenditure on education, from \$1,658,217 to \$1,777,716.

Government and Finance.—The province is administered by a lieutenant-governor assisted by an executive council. The legislative council consists of 24 members appointed for life by the governor-general; the legislative assembly numbers 74 members elected for 5 years on a property qualification. In the Dominion Parliament Quebec is represented by 24 members in the Senate and 65 in the House of Commons. The ordinary revenue and expenditure of the province for the fiscal year 1900 were \$4,451,578 and \$4,433,386 respectively, both showing a slight increase over 1899. The chief sources of revenue were the Dominion subsidies, \$959,253; woods and forests, \$1,112,530 (\$894,289 in 1899); and licenses, \$593,440. The chief items of expenditure were interest on debt, \$1,435,337; administration of justice, \$523,258; and public instruction, \$438,758. The gross debt of the province amounted at the end of the fiscal year 1900 to \$36,120,393, as compared with \$36,191,866 at the end of the fiscal year 1899.

Industries, Commerce, etc.—The mineral output of Quebec for 1899, although somewhat larger than that of 1898, is still insignificant. The output of iron ore was 19,420 tons, against 17,873 tons in 1898. The silver output also shows an increase from 40,231 ounces in 1899 to 57,800 ounces in 1900. The latter output, however, amounts only to about one-third of the quantity produced in 1890. The value of the products of the fisheries for 1899 was \$1,953,134, against \$1,761,440 in the preceding year. The principal kinds of fish were cod (\$739,880) and herring (\$250,962). The trade of Quebec, which is the largest in the Dominion, showed a considerable growth for the fiscal year 1900. The total imports for that year amounted to \$79,508,622 (\$189,622,513 for the entire Dominion), against \$72,230,739 for the preceding year. Of the total imports, \$37,572,140 represented produce of the United States. The total exports for 1900 amounted to \$76,791,668, against \$70,311,571 in 1899. The total length of railway track laid in the province at the end of the fiscal year 1900 was 3,414 miles, and the total amount paid out in subsidies up to that date was \$21,697,239. The government telegraph lines increased from 1,307 miles in 1899 to 1,412 miles in 1900. With but four Conservatives in the provincial legislature, there was practically no opposition, and the session which closed in March, 1901, was the shortest and quietest on record since confederation. A bill authorizing the erection and operation of a crematory at Montreal met with a vigorous opposition on the score of cremation being a relic of paganism, contrary to Christian, and especially Roman Catholic, teaching. It passed by a majority of one vote only, with amendments providing that the deceased had expressed a desire for cremation, and that a certificate be shown stating that at death the deceased was not a Roman Catholic.

QUEENSLAND, a state of the commonwealth of Australia, has an estimated area of 668,252 square miles. The population, according to the census of 1901, was 502,892, against 393,718 at the census of 1891, showing an increase of less than 28 per cent. for the decade, as compared with an increase of about 44 per cent. during the preceding decade. Capital, Brisbane, with a population (including suburbs) of 119,428 in 1901. Primary education is free and nominally compulsory. At the end of 1900 the state had 932 public schools, with an average daily attendance of 69,285 pupils. There were also 173 private schools, with an average daily attendance of 12,376 pupils.

Government and Finance.—At the head of the administration of the state is a governor appointed by the crown and assisted by a cabinet of 9 members. The legislative council consists of 42 members appointed by the crown for life; the legislative assembly numbers 72 members elected by universal suffrage for 3 years. The revenue for 1901 was estimated at £4,594,370, and the expenditure at £4,571,738. The former is derived mostly from customs, land, railways, and other public services. The chief items of expenditure are interest on public debt, public instruction, and public works. The public debt of Queensland amounted at the end of the calendar year 1900 to £35,898,414, against £34,348,414 at the end of the preceding year.

Industries, Commerce, etc.—About 97 per cent. of the land belongs to the government and nearly 50 per cent. is under forest. Agriculture is only slightly developed, the total area under crops being only about 430,000 acres. The chief crop is corn, of which Queensland produced nearly 2,000,000 bushels in 1899. There are also cultivated wheat and sugar cane. Grazing is well developed. The live stock comprised in 1900, 10,339,185 sheep, 4,078,191 head of cattle, and 456,788 horses. The mining industry of the state shows a considerable growth during 1900. The output of crude gold increased from 946,894 ounces in 1899 to 963,189 ounces in 1900, valued at £2,871,709. The output of other minerals (silver, coal, tin, copper) was valued at

£308,355. The number of people employed in the gold mines at the end of 1900 was 10,163, including 472 Chinese. The imports to Queensland during 1900 show an increase from £6,764,097 to £7,184,112; the exports for the same year amounted to £9,581,562, as compared with £11,942,858 in the preceding year. The imports from Great Britain for 1900 amounted to £2,563,820 (£2,905,437 in 1899), and the export of the products of Queensland to the United Kingdom were valued at £3,017,290 (£4,272,952 in 1899). The rest of the trade is chiefly with the other states of the Commonwealth. Most of the railway lines of Queensland belong to the government. In 1900 the total mileage open for traffic was 2,800, and the cost of construction of the state lines up to the beginning of 1900 was £20,815,874 (including the cost of floating loans, etc.). The telegraph lines of Queensland had a total length of about 10,300 miles in 1900.

History.—The dominant question in Queensland politics during 1901 was that of the abolition or the continuance of Kanaka or Polynesian labor on the sugar plantations. In the federal elections, in Queensland alone of all the Australian states, there was no contest over the tariff question; but the issue was sharply drawn between the Labor party, which favored the abolition of Kanaka labor, and the Ministerialists, supported by the sugar planters, who favored at least a gradual supplanting of the colored labor by the white. The cry of a "White Australia" helped the Labor party, with the paradoxical result that the state which had been supposed most strongly in favor of "black" labor voted "white," returning four out of six senators and seven out of nine representatives to the federal parliament, pledged to secure abolition of all Polynesian or Asiatic labor. Both the ministry of Mr. Robert Philp and the state legislature, however, remained favorable to the continuance of colored labor for the time being. With the introduction of the Pacific Islander Bill (see AUSTRALIA, COMMONWEALTH OF, paragraphs on History) in the federal parliament, the agitation in Queensland was renewed; and when in the face of this opposition the bill finally passed the parliament, official protests were filed with Mr. Chamberlain, the British colonial secretary, asking that the royal assent be withheld. By the terms of this act, which will practically apply to Queensland alone, 9,000 Kanakas, 3,600 of whom have deposits aggregating £27,536 in the government savings bank, will be obliged to leave Australia by the end of the year 1906.

During the legislative session a bill amending the parliamentary elections act, and modeled on the Belgian law, was introduced by the government. It extended the franchise to women, forbade plumping, and allowed voting by mail. The most interesting provision, and one which must be considered more or less experimental, was that which followed the Belgian system of allowing two votes to every man who is the father of two legitimate children born in Queensland.

QUICKSILVER. See MERCURY.

RABIES. In a pamphlet published in May, 1901, by the Bureau of Animal Industry, Washington, D. C., Dr. D. E. Salmon, chief of the Bureau, reviews the cases of hydrophobia, or rabies, which occurred in the capital city a few years ago. From 1895 to August, 1900, there were 91 animals found to be suffering from rabies in Washington, and 28 persons were bitten by these animals. In the decade from 1890 to 1899 there were 230 deaths from hydrophobia in 73 cities of the United States. In Greater New York there were 27 deaths; in Chicago, 68; and in Philadelphia, 8 were reported, though the latter figure is not deemed accurate, in view of the decision of the coroner's office that there is no such disease as rabies, and a certificate of death from this cause was refused. The facts remain that rabies is a disease, and that it is amenable to both prophylactic and curative treatment.

RACQUETS AND COURT TENNIS. The championships played in the New York Racquet Club courts in 1901 displayed the best of average play ever shown; first place was won by Quincy A. Shaw, Jr., of Boston, over Clarence H. Mackay, of New York, by 12-15, 15-5, 15-10, 15-6. The other entries were G. C. Clark, Jr., M. S. Paton, J. S. Hoyt, F. Huntington, Payne Whitney, W. B. Dinsmore, and Austin Potter, all of New York, and F. F. Rolland and W. R. Miller, of Montreal. New York won the inter-city doubles racquets against Philadelphia, 2 to 1. The Canadian championship was won by F. F. Rolland at Montreal, over W. R. Miller, who was his colleague in the New York contest. The amateur championship of America was won by Joshua Crane, Jr., of Boston. A new championship in squash racquets was won by William Post at Tuxedo. In Great Britain E. H. Miles, in matches in London, July 10 and 15, won both the gold and silver prizes, and thereby became the champion of the world. The racquet and tennis courts erected at Tuxedo will be a standing memorial of the result and influence of Mr. Miles's visit to America.

RAILWAYS. The mileage of new road constructed in 1901 is stated at 5,057 miles by the *Railway Age*, and at 4,518 miles by the *Railroad Gazette*. These figures are very approximate, the former showing an increase and the latter a decrease as compared with the previous year. The construction would have been still greater,

but for the difficulty in obtaining rails, as several hundred miles of road had been graded and made ready for the track at the end of the year which could not be finally completed for want of rails. According to the figures given by the *Railway Age*, the highest records for railway construction were shown by Texas, with 583 miles, and Oklahoma Territory, with 428 miles. The largest single line was the extension of the Chicago, Rock Island and Pacific Railway, from Liberal, Kan., to Santa Rosa, N. Mex., 265 miles. Pennsylvania excepted, there was little building in the Eastern and New England States; but west of the Mississippi, on the other hand, tracks were laid to the extent of 3,817 miles, and east of the Mississippi and south of the Ohio, 891 more miles were laid, making a total of 4,078 miles in the South and West. Over half of the new mileage was laid by a few of the larger railroad systems, 11 companies building 1,800 miles, and 23 companies building 2,580 miles. The largest amount of trackage laid by the several railroads is stated as follows: The Chicago, Rock Island and Pacific, 360 miles in Oklahoma, Texas and New Mexico; the Choctaw, Oklahoma and Gulf, 310 miles in Oklahoma, Indian Territory, Texas, and Arkansas; the Chicago and Northwestern, 223 miles in Illinois, Wisconsin and Iowa; the Cincinnati, Richmond and Muncie, 150 miles in Indiana; the Burlington, 135 miles in Wyoming, Montana, and South Dakota; the Northern Pacific, 134 miles in Minnesota, North Dakota, Montana, and Washington; the Oregon Short Line, 128 miles in Idaho, Utah, and Nevada; the St. Louis and San Francisco, 123 miles in Texas and Indian Territory; the El Paso and Southwestern, 121 miles in Arizona and New Mexico; the Minneapolis, St. Paul and Sault Ste. Marie, 110 miles in Wisconsin, North Dakota, and South Dakota; and the El Paso and Northeastern, 108 miles in New Mexico.

The following table shows by States the new construction of track in the year 1901, as given in the *Railway Age*, and shows also the total mileage of railways in the United States at the end of 1900, as given in *Poor's Manual*. Combining the results, the total trackage at the close of 1901 is found to be approximately 199,379 miles.

State.	Total Construction Dec. 31, 1900.	New Construction laid down in 1901.	State.	Total Construction Dec. 31, 1900.	New Construction laid down in 1901.
Alabama	4,197.22	102.97	Nebraska	5,695.26	.....
Alaska .....	.....	.....	Nevada	920.37	40.20
Arizona	1,515.94	85.04	New Hampshire ..	1,193.15	10.11
Arkansas	3,108.56	155.91	New Jersey	2,242.93	2.60
California	5,588.56	83.94	New Mexico.....	1,779.06	275.49
Colorado	4,649.63	108.27	New York	8,095.00	29.29
Connecticut	1,025.40	.....	North Carolina..	3,732.64	72.90
Delaware	348.62	.....	North Dakota ...	2,810.62	120.72
Dist. of Columbia.	24.88	.....	Ohio	8,885.46	67.13
Florida	3,255.71	59.80	Oklahoma Ter... ..	911.58	427.82
Georgia	5,730.02	203.45	Oregon	1,670.90	7.21
Idaho	1,319.41	117.40	Pennsylvania ...	10,310.08	153.02
Illinois	11,058.37	164.59	Rhode Island....	209.29	.....
Indiana	6,563.22	174.37	South Carolina... ..	2,919.43	47.50
Indian Territory..	1,487.60	157.15	South Dakota....	2,961.86	38.60
Iowa	9,391.90	90.34	Tennessee	3,184.91	125.13
Kansas	8,714.06	33.10	Texas	9,991.62	583.60
Kentucky	3,093.75	37.24	Utah	1,581.92	4.70
Louisiana	2,801.27	160.73	Vermont	1,045.28	.....
Maine	1,928.44	12.00	Virginia	3,794.93	26.60
Maryland	1,339.34	26.00	Washington	2,888.44	134.30
Massachusetts ...	2,111.42	.....	West Virginia....	2,484.69	100.85
Michigan	8,092.46	164.35	Wisconsin	6,538.87	195.75
Minnesota	6,996.89	170.80	Wyoming	1,279.20	77.09
Mississippi	2,934.27	98.46			
Missouri	6,887.44	189.27			
Montana	3,029.22	127.66			
			Total for the		
			United States.	194,321.09	5,057.45

The *Railroad Gazette* reports 658 miles of railway built by 163 companies in Canada, and the *Railway Age* reports 439 miles built by 12 companies in Mexico. In *Poor's Manual* there is an interesting editorial study showing the extent to which a comparatively few large railway systems control the railway business of the country. In 1900 there were 60 railway systems operating 94,128 miles of railroad, as compared with 65 systems with 70,574 miles in 1890. Commenting on a detailed statement, giving the various statistics of railways, the *Manual* says: "It appears that the 60 systems . . . controlled, in 1900, 62.8 per cent. of all the railroads in operation in the country. . . . Of the passengers carried in 1900 (584,695,935) these 60 systems carried 442,382,459, or 75.6 per cent. of the whole number, the total distance

traveled by passengers on the 60 systems being 12,936,472,872 miles at an average charge of 1.993 cents per passenger per mile, against a general average for all the roads in the Union of 2.031 cents. Of freight tonnage the companies included in the table hauled 685,908,701 tons, being 64 per cent. of total tonnage (1,071,431,919) of all the lines in the country. Their aggregate haulage equaled 111,419,695,803 tons one mile, being 79 per cent. of the grand total, while the average charge per ton per mile was 0.713 cent, or 0.033 cent less than the general average for the whole country. In 1890 the total of stock and bonds of 65 systems was \$5,209,431,474; in 1895 the total investment increased to \$5,995,374,698, the number of systems being, in that year, 61, and in 1898, for the same number of companies, the total reached \$6,454,864,171. In 1898 the total stock and bond investments reached the enormous aggregate of \$6,550,049,103, only to be still further increased to \$7,069,842,726. . . .

While the returns on capital invested in the companies' bonds show comparative steadiness—being 4.66 per cent. in 1890; 4.72 per cent. in 1891; 4.83 per cent. in 1892; 4.71 per cent. in 1893; 4.70 per cent. in 1894; 4.52 per cent. in 1895; 4.69 per cent. in 1896; 4.68 per cent. in 1897; 4.49 per cent. in 1898; 4.54 per cent. in 1899; and 4.33 per cent. in 1900—the returns on money invested in stock show a fluctuating but declining tendency from 2.39 per cent. in 1893 to 1.62 per cent. in 1896, advancing to 1.86 per cent. in 1898, and, because of exceptional prosperity, to 2.27 per cent. in 1899, and 2.89 per cent. in 1900." For foreign railways, see the various countries.

RAOULT, FRANÇOIS MARIE, chemist, and dean of the faculty of sciences in Grenoble, died April 1, 1901. He was born May 10, 1830, at Fournes (Nord), France, and was educated in Paris. He taught at the Lycée at Reims and at the College of St. Die, where he took bachelor's degrees in science and letters. In 1866, after submitting a thesis on *The Electromotive Force of Voltaic Cells*, he was made a *Doctor des Sciences Physiques*, and in 1870 he was appointed a professor of chemistry at Grenoble, a chair which he held at the time of his death. His early experiments were concerned with the chemical effects of the electric current; but after he was settled at Grenoble he devoted himself to chemical researches. His most important work deals with the freezing and boiling points of solutions, especially the non-aqueous solutions, and he has published many papers on this subject. To him is due the discovery (1884) that "a molecule of any substance dissolved in one hundred molecules of a liquid lowers the freezing-point of the latter a nearly constant amount." He also showed (1886) that the lowering of the vapor tension is proportional to the ratio between the number of molecules of the dissolved substance and the total number of molecules present. His most important discovery, however, was that electrolytes in solution lower the freezing-point of water more than non-electrolytes. These experiments, with those of Pfeffer, were introductory to the great work of Arrhenius and Van't Hoff (*q.v.*), which have made the science of physical chemistry so remarkable.

READING, PSYCHOLOGY OF. See **PSYCHOLOGY, EXPERIMENTAL** (paragraph Clark University).

REARICK, PETER ANTON, rear-admiral, U. S. N. (retired), died in Washington, D. C., February 9, 1901. He was born in Maryland, November 12, 1838, and became a third assistant engineer upon graduating from the Naval Academy in 1860. Promoted to chief engineer in 1874, he rose to the (relative) rank of commander in 1892, serving during 1893 as a member of the Steel Inspection Board, and as inspector of machinery in 1896. In March, 1899, the year of his retirement, he was given the rank of captain, becoming rear-admiral upon his retirement in December. Of Captain Rearick's forty years of service in the navy, twenty-one were spent at sea.

REDHEAD, RICHARD, English organist and composer, died in London, May 3, 1901. He was born at Harrow, England, in 1820, and was educated at Magdalen College, Oxford. For a number of years he was organist of St. Mary Magdalen's Church in London, and composed various masses and much vocal church music. He edited the collections, *Cathedral and Church Choir Book*, the *Parochial Church Tune Book*, and *The Universal Organist*.

REDMOND, JOHN EDWARD, leader of the Irish party in the British Parliament, and a prominent Irish Nationalist and Parnellite, visited the United States in 1901 for the purpose of obtaining support for the United Irish League. He was born in 1851, the son of a member of Parliament from Ballytrent, Ireland, and was educated at Trinity College, Dublin. After studying law he was admitted to practice at Gray's Inn in 1886 and at the King's Inns in 1887. For some time he was clerk in the vote office in the House of Commons, and was elected to Parliament first in 1881, from New Ross. In 1885 he was returned from North Wexford, and from Waterford in 1891, a constituency which he still represents.

REED, ROLAND LEWIS, American actor, died in New York City, March 30, 1901. He was born in Philadelphia in 1852. After playing children's parts he joined the stock company of Mrs. John Drew at the Arch Street Theatre, Philadelphia, and remained there until 1871, when he left for New Orleans. From then until 1882 he played in various companies, appearing in all the principal cities of the United States, and in the latter year organized his own company, which produced many successful plays. Mr. Reed's parts were diverse, but his success was won as a comedian, in which rôle he appeared exclusively in his later career.

REFORM CHRISTIAN SCIENCE CHURCH ASSOCIATION, a body of Christian Scientists, entirely independent of the church of which Mrs. Eddy is the acknowledged leader, was chartered in 1899. During its brief existence some 280 churches and societies have been organized, and its students are found all over the world. The International Metaphysical University, of Washington, is controlled by the association, which also publishes the *Washington News Letter*, edited by Oliver C. Sabin. The following statement, based on information obtained from the editor of that journal, summarizes the doctrinal status of the church: The church believes in divine healing in answer to prayer in and through the name of Jesus Christ, according to rules laid down by the Saviour and the Apostles, and it believes that all other healing which eliminates the ministration of Jesus Christ is in error; it asserts that the principle is not of recent growth, and was not "discovered" by anybody, but has been in practice more or less since the beginning of the Christian era, and especially since the days of Bishop Berkely, who, in 1710, published the cardinal principles on which divine healing is based, since which time other works have been issued at intervals; it holds to the immaculate conception of Jesus Christ and believes Him to be the actual son of God; it withholds from Mrs. Eddy any endowment of especially divine attributes, rejects Mrs. Eddy's domination in restricting to certain approved persons the teaching of "God's Truth," affirming that the "Truth" is free, was intended so to be, and should not be controlled by copyright or in other restrictive ways; does not recognize the principle of implicit obedience to the teacher, and allows withdrawal, after affiliation with the church, without any attached penalty.

REFORMED CHURCH IN AMERICA (DUTCH), until 1857 known as the Reformed Protestant Dutch Church, claims through its oldest branch, the Collegiate Reformed Protestant Dutch Church, which has enjoyed a continuous existence since 1628, the distinction of being the oldest Protestant church in America. It now has 111,171 communicants, with 654 ministers and 736 churches, and 915 Sunday schools, in which are enrolled 123,934 scholars. Contributions for 1901 included \$286,928 for denominational enterprises, \$1,165,216 for congregational purposes, and \$92,508 for other objects. The board of domestic missions, as the agent of church extension, during 69 years of organized effort, has established missions in fourteen western States, including Oklahoma, and as far northwest as Washington; during the past year it has aided in erecting eight churches, and as many became self-supporting through the instrumentality of the board. The building fund received \$7,741 during 1901. Foreign missionary work, begun in 1836, now includes five missions in China, India, Japan, and Arabia, where there are 23 stations and 234 out-stations, with 31 ordained native ministers and 430 native helpers, ministering in 41 churches, with nearly 5,000 members. In 190 boarding and day schools there is an enrollment of 7,345 scholars. The receipts for the current year in behalf of this work were \$173,204, the largest amount in the history of the board, which has expended since 1832 more than \$3,500,000. The Reformed Church comprises 35 classes and 4 particular synods under the general synod, which convenes annually. The session of 1901, in the early part of June, at New Brunswick, was important particularly for the appointment of Rev. W. H. S. Demarest to succeed Dr. S. M. Woodbridge in the chair of ecclesiastical history and government in the seminary at New Brunswick, and for changes in the forms of baptism, of public reception of members received by certificate, and of ordinations and installations. The meeting of 1902 will be held at Asbury Park, N. J. President of the general synod, Rev. Denis Wortman, D.D.; stated clerk, Rev. W. H. De Hart, Raritan, N. J.

REFORMED CHURCH IN THE UNITED STATES (GERMAN). The supreme body, the general synod, which was established in 1863, meets triennially, the next session to be held in 1902 in Baltimore, and now is comprised of 8 synods 58 classes, with 1,112 ministers, 1,691 congregations, and 248,918 communicants. The church reports for 1901 a period of progress, its gain in membership (243,545 in 1900) and contributions being noticeable, the aggregate for benevolent purposes being \$264,344, as against \$245,166 during the preceding year, and for congregational purposes \$1,303,217, as against \$1,189,838 for the same period. The effective organization of home missionary work is expressed through 99 branches under the general board and 34 under the German boards, which include also, besides the Bohemian, Hungarian, German-English, and English departments, the Harbor Mission in New

York, an interesting feature of the work. Church building, too, is an important branch of the home department; the general board now has about \$200,000 invested in land and buildings. Foreign missionary work in Japan with the connectional educational institutions, industrial home, and Y. M. C. A., is in a more prosperous condition than in China, where the work, though recovered from the disasters of 1900, suffers from lack of sufficient working force. The debt that at present hampers the work of these two departments is the subject of great regret. Stated clerk of the general synod, Rev. John P. Stein, D.D., Reading, Pa.

REFORMED EPISCOPAL CHURCH, founded in 1873, has, according to its latest statistics—those reported at the triennial general council of 1900—7 synods and missionary jurisdictions; 64 churches, property valuation \$1,629,556; 80 presbyters and 12 deacons, besides 7 bishops, and 10,002 communicants. There are 88 Sunday schools, with 10,328 members. Contributions for all the various church activities aggregated \$179,537. The denomination maintains a theological seminary at Philadelphia and a publication society in the same city.

REFORMED PRESBYTERIANS, descended from the Reformed Presbyterian Church of Scotland, comprises: *Reformed Presbyterian Church in the United States (Synod)*, with 113 congregations, 124 ministers, and 9,802 communicants; *Reformed Presbyterian Church in North America (General Synod)*, with 37 churches, 32 ministers, and 5,000 communicants; *Reformed Presbyterian Church (Covenanted)*, with 1 church, 1 minister, and 37 communicants, and *Reformed Presbyterian Church in the United States and Canada*, with 1 church and about 600 communicants. The Reformed Presbyterians (Synod) maintain a college, and enterprising missionary work among the Indians in Oklahoma and the freedmen of Alabama, and in China, Syria, Cyprus, and Asia Minor. The denomination publishes the *Christian Nation* (New York) and a missionary magazine, *Olive Tree*. Total contributions (1901) for all purposes aggregated \$164,735. Both the synod and general synod held interesting sessions during 1901, the former in Pittsburg and the general synod in Cincinnati. The meetings of the two bodies in 1902 will convene in Syracuse and in Philadelphia respectively.

REGENERATION. See ZOOLOGICAL LITERATURE (paragraph Special Treatises).

REMSEN, IRA, professor of chemistry at Johns Hopkins University, was chosen president of that institution in June, 1901. He was born in New York City, February 10, 1846, and was educated at the College of the City of New York, graduating in 1865, and at the College of Physicians and Surgeons, in the same city. After several years of study in Germany, where he was for a time assistant to Professor Fittig at the University of Tübingen, he returned to the United States in 1872 to take the chair of chemistry at Williams College. He retained this position until 1876, when he was called to organize the department of chemistry at the newly established Johns Hopkins University, in Baltimore. In 1879 he founded, and has since edited, the *American Chemical Journal*. He is a member of the National Academy of Sciences, of the Chemical Society of London, and an honorary member of the Pharmaceutical Society of Great Britain. He has published a number of works on chemistry, among which are: *The Principles of Theoretical Chemistry* (1876); *Organic Chemistry* (1885); *Introduction to the Study of Chemistry* (1887); *The Elements of Chemistry* (1888); *Inorganic Chemistry* (1889); *A Laboratory Manual* (1889); and *Chemical Experiments* (1895). As a teacher Dr. Remsen has been highly successful, and as an original worker in his selected science he has gained a high place.

REUNION, an island in the Indian Ocean, 420 miles east of Madagascar, has been a French colony since 1764. It has an area of 965 square miles and a population of 171,720. The capital is St. Denis, with 32,850 inhabitants in 1899. The colony is administered by a governor, assisted by a privy council and an elected council-general, and is represented in the French parliament by a senator and two deputies. The local budget for 1900 showed income and expenditure of 5,425,300 francs, and the French budget for 1901 showed an expenditure for the colony of 4,256,184 francs. Imports in 1899 were valued at 20,966,343 francs and exports at 15,357,475 francs. Three-fourths of the imports and nearly the entire export trade is with France, the exports to France in 1899 being 15,036,683 francs. The principal exports are sugar, coffee, vanilla, spices, and cacao, sugar being the largest, and valued in 1899 at 8,681,343 francs. There are 83 miles of railway in Réunion, owned by the state. In 1897 there were 148 schools, with 14,000 pupils enrolled.

RHODE ISLAND, a New England State of the United States and one of the original thirteen, has an area of 1,250 square miles. The population in 1900 was 428,556, an increase since 1890 of 83,050. The population in June, 1901, as estimated by the government actuary, was 438,000. By a constitutional amendment adopted in 1900, Newport was abandoned as the second capital of the State, and Providence is now

the sole capital. The largest cities in 1900 were Providence, 175,597; Pawtucket, 39,231, and Woonsocket, 28,204.

Finance.—The receipts of the treasury for the year ending December 31, 1901, were \$1,577,294.11, expenditures \$1,597,610.78, leaving in the treasury \$158,272.71. On December 31, 1901, the State debt was \$2,978,000, all bonded; \$22,000 was paid on the debt during the year. The State tax rate for 1901 was 1.8 mills per \$1.00.

Industries.—The census reports of 1900 indicate a steady growth in manufacturing interests in Rhode Island since 1850. In that time the population increased from 147,545 to 428,556, or 190.5 per cent., while the average number of industrial wage-earners increased from 20,967 to 96,528, or 360.4 per cent., embracing in 1900 22.5 per cent. of the entire population, a percentage unsurpassed by any other State. In the latter year the amount of actual capital invested in 4,189 establishments reporting, exclusive of capital stock, was \$183,784,587, the gross value of the products \$184,074,378, and the net value, exclusive of products re-used in the process of manufacture, \$119,126,486. The textile industries are the most important in the State, with a product in 1900 valued at \$78,133,258, or 42.4 per cent. of the total value of the products of the State, an increase of 14.3 per cent. since 1890. Ranked by the number of spindles, Rhode Island has stood next after Massachusetts in the cotton manufacture since the beginning of the industry in this country. It ranks third among the wool-manufacturing States, but the production of the latter goods is decreasing and that of worsted goods is increasing very rapidly, the increase in the value of the latter product since 1890 being \$11,021,645. Since 1794, when a citizen of Providence invented a process for "filling" gold with cheaper materials and also applied machinery to the operation, that city has been prominent in the manufacture of jewelry. The product in 1900 was valued at \$13,320,620, an increase of 66.3 per cent. since 1890, in which year one-fifth of the product of the jewelry industry of the country was manufactured in Providence. Allied to this are the manufacture of silverware and the refining of gold and silver sweepings, with products in 1900 valued respectively at \$3,834,408, an increase of 52.8 per cent. since 1890, and \$3,484,454. The manufacture of machinery, which ranks third in importance, has been stimulated by the demand for it in the textile and jewelry factories. The product in 1900 was valued at \$13,269,086, an increase of 30.5 per cent. since 1890. Other industries are the manufacture of files, with a product in 1900 valued at \$1,033,838; of rubber and elastic goods, valued at \$2,518,268; of malt liquors, valued at \$1,880,171; of rubber boots and shoes, valued at \$8,034,417, and of electrical apparatus and supplies, valued at \$5,113,292.

Conventions and Elections.—The Democratic State convention which met at Providence on October 15 adopted a platform, as did most of the Democratic State conventions during the year, almost wholly confined to State issues. The State Republican government was charged with corruption, boss rule, and the waste of the public funds. A new State constitution was advocated, by which the existing system of legislative representation would be changed, greater powers being given to the governor and less to the general assembly. The Republican State convention, on the other hand, which met in Providence on October 16, expressed continued loyalty to the principles of the national Republican party as expressed in their convention of 1900; condemned the action of southern States in disfranchising the negroes, and called upon Congress to base representation in the House upon the voting power of each State and not upon the total population. Lynching and anarchy were condemned, and an Isthmian canal, to be under the control of the United States, was advocated. At the State election held on November 5 the entire Republican ticket was elected, though by the smallest plurality in several years. In 1900 the plurality for McKinley was 13,972, while in 1901 the plurality for William Gregory as governor was only 6,537. The total votes cast for the Republican and Democratic nominees were: William Gregory (Rep.), 25,575; L. F. C. Garvin (Dem.), 19,038. The other members of the Republican ticket elected were: Lieutenant-governor, C. D. Kimball; secretary of state, C. P. Bennett; treasurer, Walter A. Read; attorney-general, C. F. Stearns. The legislature of 1902 will have 87 Republicans and 24 Democrats. D. L. D. Granger (Dem.) was reelected mayor of Providence by an increased plurality. P. J. Doyle (Dem.) was elected mayor of Newport by 28 votes.

State Officers.—Governor, William Gregory, Republican, elected November, 1901, died December 16, 1901, succeeded by Charles D. Kimball, term one year, ending January, 1903; secretary of state, Charles P. Bennett; treasurer, Walter A. Read; auditor, Charles C. Gray; attorney-general, Charles F. Stearns; superintendent of public instruction, Thomas B. Stockwell; railroad commissioner, Edward L. Freeman; chief justice, life term, John H. Stiness.

Supreme Court: Chief justice, John H. Stiness; associate justices, Pardon E. Tillinghast, George A. Wilbur, Horatio Rogers, William W. Douglas, and Edward C. Dubois—all Republicans.

Congressional Representatives (57th Congress).—In the House—Melville Bull, from Middletown, and Adin B. Capron, from Stillwater—both Republicans. In the Senate: Nelson W. Aldrich (until 1905), from Providence, and George P. Wetmore (until 1907), from Newport—both Republicans.

RHODESIA, a vast tract of British territory in South Africa, extending from Bechuanaland and the Transvaal on the south to the Congo Free State on the north, and from Angola and German Southwest Africa on the west to Portuguese East Africa and the British Central Africa Protectorate on the east. It has an estimated area of over 750,000 square miles, and an estimated population of upward of 1,500,000. The country is divided by the Zambezi River into Northern Rhodesia, comprising the districts of Northwestern Rhodesia (or Barotseland) and Northeastern Rhodesia, and Southern Rhodesia; the last-named comprises the two provinces of Mashonaland and Matabeleland. The region north of the Zambezi has been very little developed and is largely occupied by natives, whose number is estimated roughly at about 1,000,000. Its estimated area is 575,272 square miles. Mashonaland, with an area of 114,000 square miles, has a population of 330,000, of whom about 4,000 are Europeans, while Matabeleland, area 60,728 square miles, has 170,128 inhabitants, 10,000 of whom are of European origin or descent. Salisbury, in Mashonaland, with 2,000 white inhabitants, and Buluwayo, in Matabeleland, with 7,500 white inhabitants, are the chief towns. The entire territory of Rhodesia is under control of the British South Africa Company, an English corporation, capitalized at £5,000,000, of which the Duke of Abercorn is president, and the success of which has in large part been due to Cecil Rhodes. Both of the districts of Northern Rhodesia are administered by officials of the company, the share of the Cape Colony government in the protectorate of Barotseland being somewhat greater than in the northeastern district. In the two provinces of Southern Rhodesia the administration is more highly organized. There is a resident commissioner (Lt. Col. Sir Marshal J. Clarke), appointed by the British colonial secretary, with headquarters at Salisbury, in Mashonaland. Administrators represent the company in both provinces, the one resident at Salisbury being known as the senior administrator. There is an executive council, consisting of the commissioner, the administrators, and four members nominated by the company, and a legislative council, in which the above-named executives have seats, and consisting in addition of five members nominated by the company and four delegates chosen by registered voters, two from each province. All enactments of the councils are subject to the sanction of the resident commissioner, as representing the crown. The laws in force are those of Cape Colony, with some modifications. In spite of an extraordinary series of misfortunes which have occurred in the region in the past five years, including drought, famine, native uprisings, and the South African War, the country has developed with remarkable rapidity.

The revenue and expenditure of Southern Rhodesia for the fiscal year ending March 31, 1901, were £406,467 and £633,849 respectively, as against £325,180 and £702,400 respectively for the preceding year. The estimated revenue for the fiscal year 1902 is £469,000 and the expenditure £758,296. In the fiscal year 1901 the dutiable imports were valued at £322,522 and the non-dutiable imports at £899,446, a total of £1,221,968. The customs receipts amounted to £91,430. The value of merchandise dispatched to Rhodesia in 1900 through the customs house at Beira, in Portuguese East Africa, was £926,322, as against £178,820 during the previous year.

In Northern Rhodesia extensive mineral deposits have been discovered, of which copper is the most important. In Southern Rhodesia tobacco, india-rubber, indigo, and cotton are raised, and European fruits, cereals, and vegetables are being introduced. Southern Rhodesia is also rich in mineral deposits, the gold output of Mashonaland alone in the year 1900-01 being valued at over £400,000. According to Lord Milner, high commissioner for South Africa, there were, in the fall of 1901, 658 miles of railway under construction in Southern Rhodesia. It was expected that the railroad from Salisbury to Buluwayo would be finished early in 1902, effecting complete railway communication between Cape Town and Beira, a distance of 2,000 miles. In the fall of 1901 the high commissioner also stated that the following railway lines were under construction in Southern Rhodesia: "(1) A line (3 ft. 6 in. gauge) from Buluwayo through Gwelo to the Globe and Phoenix mine—150 miles; (2) a line (3 ft. 6 in. gauge) from Salisbury to the Globe and Phoenix mine—150 miles; (3) a line (2 ft. gauge) from Salisbury to the Ayrshire coal mine, Lomagondi district—78 miles; (4) a line (3 ft. 6 in. gauge) from Buluwayo to the Givanda district, Matabeleland—120 miles; (5) a line (3 ft. 6 in. gauge) from Buluwayo in the direction of the Wankies coal field and Victoria Falls—160 miles." It was expected that the last-named line would be continued beyond the Zambezi.

Very recent discoveries are confirming scientists in the belief that the country between the Zambezi and Sabi is the Ophir of Solomon's time. Dr. Carl Peters,

who has been exploring this territory, has found many evidences of an ancient civilization. He is of the opinion that at one time the country was an Egyptian colony, which some time between 1600 B.C. (Queen Hatsepu's expedition) and 1100 B.C. (King David's period) was taken by a people of Phœnician origin.

RHYTHM, PSYCHOLOGY OF. See **PSYCHOLOGY, EXPERIMENTAL** (paragraph Clark University).

RICE. The most notable factor in rice production is the rapid extension of the area devoted to that crop in Louisiana and Texas. This movement began in 1884, when a few farmers from the northwestern prairie States settled on the great southern prairie which extends along the coast from the parish of St. Mary, in Louisiana, to the Texas line. By adapting the agricultural machinery to which they had been accustomed to the rice industry and managing rice fields like the bonanza wheat farms of Dakota, they produced large crops and made fortunes. When their business was almost ruined by a succession of dry years, they put in pumping plants for raising water from the streams, dug irrigation canals and ditches, and deep wells for irrigation where streams were not available. The rice area has more recently been extended into southeastern Texas, where there is a belt of prairie well suited to rice, reaching from the Sabine River west for 100 miles or more along the coast. "In 1896, however, a new difficulty began to be heavily felt. The varieties of rice which yielded best and were otherwise most satisfactory from a cultural standpoint under the new system, proved inferior commercially because the percentage of grains broken in the process of milling was very large, and the proportion of 'head rice' made up of the unbroken grains was low." To remedy this difficulty the Department of Agriculture imported from Japan, in the spring of 1899, about 10 tons of the variety of rice known as Kiashu, which possesses superior milling qualities. The experimental tests of this variety have proved successful and have already led to the investment of millions of dollars in rice-growing in Louisiana and Texas. The secretary of agriculture, in his report for 1901, states that "in 1900 about 8,000,000 pounds more rice were produced than in 1899, and this year 65,000,000 pounds more were produced than in 1900. With the rapid increase in our own production, the importation of rice from foreign countries is falling off, as shown by the fact that in three years the imports have decreased from 154,000,000 pounds to 73,000,000 pounds. All the increase in home production cannot, of course, be ascribed to the department's introduction and distribution of Japanese rice, but the great impetus to its production in this country was given by the department's introduction three years ago. Evidently it will be but a few years until the United States will not only grow all the rice consumed here, but will export part of the product as well." The following statistics of United States trade, for years ending June 30, are taken from tables prepared by Mr. F. H. Hitchcock, chief of the section of foreign markets, United States Department of Agriculture: Imports and exports of rice in 1900, 93,648,451 pounds, valued at \$1,904,915, and 12,945,009 pounds, valued at \$500,364, respectively; similar figures for 1901 were 74,598,061 pounds, valued at \$1,588,044, for the imports, and 1,078,958 pounds, valued at \$42,807, for the exports; the imports of rice flour, rice meal, and broken rice in 1900 amounted to 23,031,440 pounds, valued at \$374,121, and in 1901, 42,601,549 pounds, valued at \$736,854; the exports of rice bran, meal, and polish in 1900 amounted to 28,119,408 pounds, valued at \$167,023, and in 1901, 23,448,888 pounds, valued at \$143,922.

RIESCO, JERMAN, new president of Chile, succeeding the late President Errázuriz (*q.v.*), was inaugurated September 18, 1901. He was born at Rancagua, May 28, 1854, and was educated at the Santiago Council Seminary and at the University of Chile. He secured a position in the department of justice, where he afterward became chief secretary. In 1880 he was made counsellor of the Santiago court of appeal, and in 1890 minister in the same court. He rose in the department until, in 1897, he became fiscal of the supreme court, but resigned in 1898. In 1900 he was elected senator from Talca.

RIGGS, ELIAS, Presbyterian missionary, died at Constantinople, January 17, 1901. He was born at New Providence, N. J., November 19, 1810, and graduated at Amherst College in 1829. He was ordained to the Presbyterian ministry in 1832, and from then until his death was a foreign missionary under the direction of that denomination. He was stationed at Athens, Argos, and Smyrna before 1853, in which year he settled at Constantinople. Dr. Riggs was an accomplished scholar and linguist, and in addition to preparing grammars of languages of the Semitic group, translated the Scriptures into Armenian and Bulgarian and wrote numerous tracts in these languages.

RIIS, JACOB AUGUSTUS, American journalist and social reformer, published in 1901 his most important book, *The Making of an American*, an autobiography. He was born at Ribe, Denmark, May 3, 1849, and received an education in the Latin school of his native town. He came to the United States and engaged in newspaper

work, and for a time was with the *New York Sun*. While in this position he began to investigate the deplorable conditions in the crowded tenement districts of the city, and in their interest wrote and lectured against the inactivity of the municipal authorities. His protests took effect after a time, and many of the worst slums were torn out, playgrounds were opened, and parks provided for the recreation of the poor. With all this work Mr. Riis has been closely identified, though the only official connection he ever had with it was as secretary of the New York Small Parks Commission in 1897. His published books include: *How the Other Half Lives* (1890); *The Children of the Poor* (1892); *The Newsboy's Christmas* (1893); *Out of Mulberry Street* (1898); and *A Ten-years' War* (1900). He has also written many magazine articles.

ROADS. See PAVEMENTS AND ROADS.

ROCK, MILES, astronomer and engineer, died in Guatemala, January 29, 1901. He was born at Ephrata, Lancaster County, Pa., and was educated at Franklin and Marshall College and Lehigh University. He graduated from the latter institution as a civil engineer in 1869, his education having been interrupted by service in the Union army. In 1870 he became assistant at the Cordoba Observatory in Argentina, and four years later was engaged in latitude and longitude determinations for various scientific bureaus of the United States government in Central America and the West Indies. In 1880 he was appointed assistant at the United States Naval Observatory, and was a member of the party sent to Chile to observe the transit of Venus. During the last fifteen years of his life he acted as astronomical engineer for Guatemala, and was chief of the Guatemala boundary commission that fixed the boundary between Guatemala and Mexico.

ROE, FRANCIS ASBURY, rear-admiral, U. S. N. (retired), died in Washington, December 28, 1901. He was born in New York, October 4, 1823, and graduated at the Naval Academy in 1847. His first active service was in China, in 1854, where, as executive officer of the brig *Porpoise*, he fought 13 armored pirate junks and destroyed a Chinese rendezvous. As executive officer in the Civil War, he was on the *Pensacola* in 1861 when it passed down the Potomac, through nine miles of Confederate batteries, under constant fire. He was with Farragut's fleet in 1862-63. He took part in numerous engagements and commanded the gunboats *Katahdin* and *Sassacus*. From master he was promoted to lieutenant in 1855, lieutenant-commander in 1862, commander in 1866, captain in 1872, commodore in 1879, and rear-admiral in 1884, a year before his retirement from active service.

ROGERS, JOHN RANKIN, governor of Washington, died at Olympia, December 26, 1901. He was born at Brunswick, Me., September 24, 1838. From 1860 to 1866 he was a school teacher and farmer in Illinois, and for ten years afterwards was in the drug business. In 1876 he went to Kansas, where he took an active part in the Farmers' Alliance movement, and was for a time editor of a Wichita newspaper. From Kansas he went, in 1890, to Washington, and four years later was elected to the State legislature. Mr. Rogers was elected governor of Washington in 1896 on the Populist ticket, and was reelected in 1900. Among his published writings, principally in support of Populism, are *The Irrepressible Conflict*, *Looking Forward*, and *The Inalienable Rights of Man*.

ROMAN CATHOLIC CHURCH. The privileges of the Holy Year having been officially extended to cover any six months in the year 1901, throughout the Roman Catholic world, pilgrimages, unique in interest, were frequently made to the designated shrines by great processions, thus to secure the indulgences of the Jubilee period. On January 12, 1901, the ceremony of closing the *Porta Sancta* was performed with appropriate rites. Early in the year 1901 the Pope addressed to the prelates of the universal church an encyclical on *Christian Democracy*. Referring to other encyclicals of 1878 and 1891 on the errors of socialism, this late message is devoted, in reality, to a condemnation of socialism, which is sharply differentiated from Christian democracy, the latter being founded on "principles of divine faith." It touches upon the position of labor, urges the maintenance of diversity of rank natural to a well-ordered state, recommends alms-giving, the preservation of ties of social charity, thrift, morality, and religion, and adds a plea for the authority of the church and an exhortation to the faithful, in the interests of social peace. (For the cardinals of the church, see **CARDINALS**.) During 1901 the sacred college lost by death Cardinals Sebastian Galeati, archbishop of Ravenna, created cardinal in 1890, and A. M. Cascajares, archbishop of Valladolid, consecrated in 1895. The budget of the Vatican for 1901 shows a deficit equal to \$60,000. The papal income amounted approximately to \$1,400,000, of which a seventh is furnished by the emperor of Austria-Hungary, a seventh derived from income on investments, and the remainder is supplied by Peter's Pence.

United States.—The Roman Catholic Church, the oldest ecclesiastical organization in the United States, as well as the most numerous Christian denomination, has, ac-

cording to the statistics of Dr. H. K. Carroll, 9,158,741 members, with 12,113 ministers and 12,313 churches. The hierarchy in this country, which is one of the largest in the church, consists of the apostolic delegation at Washington, headed by Mgr. Sebastian Martinelli, papal legate, 14 archbishops, one of whom is a cardinal, and 81 bishops. During the past year the church in the United States sustained the loss by death of Mgr. James McMahon (*q.v.*), Rt. Rev. Michael Wigger, D.D., bishop of Newark, and Rt. Rev. John Moore, bishop of St. Augustine, John J. O'Connor, D.D., was appointed bishop of Newark, Rt. Rev. William H. O'Connell, D.D., bishop of Portland, Me., and Mgr. E. A. Garvey became the first bishop of the newly erected (1901) see of Altoona. The consecration of Rt. Rev. Peter J. Muldoon as auxiliary bishop of Chicago was the occasion of attacks by Father Crowley upon members of the priesthood, which resulted in his excommunication, giving rise to a controversy that was eventually carried to the Illinois courts. The appointment of Dr. F. Z. Rooker, secretary of the apostolic delegation, to be private chamberlain to the Pope was cited in evidence of papal favor to America, Dr. Rooker being the first not an Italian to receive this honor. The investiture at Dubuque, Ia., of Archbishop John J. Keane with the pallium, and the ceremony that marked the formal elevation of Mgr. Martinelli to the dignity of cardinal were elaborate and impressive beyond those ordinarily witnessed in America. A noteworthy event of the year was the convention of missionaries to non-Catholics, held in August at Winchester, Tenn. The Catholic Missionary Union for several years has maintained missionaries in various parts of the United States, but particularly in the South, and the work has grown to such proportions as to indicate the need for a general missionary conference. Here originated the project of a new Roman Catholic seminary, the main feature of which is to be the education of missionary clergy for home and colonial fields, a scheme that met the hearty approval of the archbishops of the church in their meeting toward the close of the year. The statement has been made that 100,000 converts were added as the result of missionary activity last year. The American Federation of Catholic Societies was established December 10-12, 1901, in Cincinnati, one of the most notable efforts in this country of the Roman Catholic laity. About 500 delegates, representing a constituency of 600,000 members, met in the interests of social, fraternal, and benevolent union, and formulated a constitution providing for centralized power in a national executive council, without interference in the local autonomy of affiliating societies. A feature of the constitution is its provision against the introduction of partisan politics into any of the meetings of the general or subordinate bodies. President, T. B. Minahan, Columbus, O.; secretary, A. Matre, Cincinnati, O.; treasurer, H. J. Fries, Erie, Pa. In 1902 the federation will meet in Chicago. Among other events of 1901 were the dedication, on January 27, of the Cathedral of St. Mary's at Covington, Ky., and the golden jubilee of St. Mary's Seminary in Cincinnati, October 22-24. See CATHOLIC COLLEGES IN THE UNITED STATES.

The Philippines.—Archbishop Chapelle, apostolic delegate to the Philippine Islands, whose mission has been barren, apparently, of actual results, was succeeded on October 20 by Rt. Rev. Donatus Sbarretti, bishop of Havana, who, it is stated, is to endeavor to arrange an agreement between the natives and the American government. The appointment of Bishop Sbarretti, whose diocese is to be administered by the archbishop of Santiago, is in itself notable, as indicating concession to the Cuban party, which, desiring a native bishop of Havana, opposed strenuously his appointment in 1900. In the Philippines there is said to be a Roman Catholic population of 6,500,000 in nearly 1,000 parishes and missions, all but about 150 administered by the orders to which the natives are not admitted, and which they particularly oppose. (For the question of monastic orders, see PHILIPPINES.) Toward the close of the year announcement was made of a papal bull to be issued through Archbishop Nozaleda, of Manila, projecting the establishment of four or five new sees, the holding of a provincial council, and new regulations in clerical education; but no great or subversive changes.

Europe.—In the early part of 1901, interesting statistics as to the Roman Catholic population of Europe appeared in the London *Tablet*, according to which the church numbers over 180,000,000 members, with about 250,000 priests, and over 160,000 church edifices. Belgium, Luxemburg, Spain, Portugal, and Italy are 99 per cent. Roman Catholic, while Scandinavia has but a fraction of 1 per cent. of Roman Catholics.

In England a controversy of considerable acrimony has centred in the "anti-Catholic oath" of the sovereign, offensive in its pronouncement against certain Roman Catholic doctrines. "A committee in the House of Lords found that the language of the declaration might be modified so as to remove objectionable features, while still maintaining security for Protestant succession. The debate on the proposed change created much comment, memorials urging no change were received, and the Roman Catholic position was vigorously presented. Cardinal Vaughan's address on phases

of the controversy, before the Catholic Truth Society, at Newcastle, September 9, 1901, was widely noticed. Conservative opinion on the matter has placed its weight in favor of removal of the part objectionable to so large a number of loyal subjects.

The most general topic of interest during 1901, in connection with the Roman Catholic Church, was the French Law of Associations, which was passed June 28, after violent debate, the official text being promulgated on July 1. The Pope signified his permission to the congregations to apply for authorization, an action taken to avert consequences that would follow extinction of the orders, and one accepting, though under a quasi-protest, the superior legal rights of civil government. A considerable exodus of the orders during the summer to Spain, England, and other countries was reported. See FRANCE (paragraph Associations Bill); see also PORTUGAL.

RÖNTGEN RAYS IN MEDICINE. Finsen's success with phototherapy has led others to experiment with the electric rays and with the X-rays in the treatment of various conditions and diseases. Francis H. Williams reports, in the *Journal of the American Medical Association* for September, 1901, that in his experience the X-rays form a useful therapeutic agent in all forms of external growths except those of syphilis. Epidermoid cancers, epitheliomata, and rodent ulcers, as well as plasmoma or simple cases of ulceration or necrosis, yield equally well to this treatment. With his treatment, if care be taken to protect surrounding parts and no X-ray "burn" of the exposed tissues is allowed, the growths disappear rapidly, odor and pain are controlled at the outset, and little interference with occupation is demanded. He alludes to the expense of the essential apparatus and the difficulty in using it, and the necessity of repeated treatment. Pusey recommends the Röntgen rays in the treatment of diseases of the skin, such as eczema, lupus, tinea tonsurans, favus, and sycosis, as well as of epithelial cancer. He suggests possible benefit in acne and hyperidrosis. In the removal of superfluous hair, he was successful in producing alopecia in 7 out of 9 cases. Dr. Harvey P. Towle, in the *Boston Medical and Surgical Journal* for April 11, 1901, after reviewing the literature of the therapeutic use of the X-rays, concludes: (1) That the real nature of the X-rays is not yet determined definitely, nor whether the therapeutic result of their use is due to the action of the rays themselves or of something of electrical origin accompanying them; (2) that the treatment is not without danger unless the greatest care is used; (3) that the effects of the X-rays run a slow course; (4) that whatever may be the exact origin of the effects produced, a definite reaction is caused in the skin by the use of the X-rays; (5) that the changes induced in the skin by the use of the X-rays are similar histologically to those seen in ordinary inflammation; (6) that the X-rays are not proved to have any bactericidal power; (7) that their therapeutic effect is probably due to the inflammation excited; (8) that hair can be removed by their use, and that lupus and several other diseases can be healed over; (9) that in a few reported cases we may fairly assume that a permanent cure has been effected, but that in a majority of the reported cases too little time has elapsed to rule out the possibility of a return of the disease; (10) that the effect of exposure to the X-rays is so extraordinarily slow in disappearing that months should elapse before an absolute cure is assumed; (11) that while the permanency of the cure effected may perhaps be doubtful as yet, it is certainly desirable to experiment further.

RÖNTGEN, WILHELM CONRAD, professor of physics and director of the laboratory at the University of Würzburg, Germany, in 1901 won the Nobel prize (*q.v.*), in physics. He was born at Lennep, Prussia, in 1844, and was educated at Zurich, graduating as doctor of science at the university there in 1869. A year later he became assistant to Professor Kundts, at Würzburg, and in 1872 he went to Strasburg, where, in 1876, he was lecturer at the university. In 1879 he became a full professor at Giessen, and in 1888 he joined the faculty of the University of Würzburg. It was while at this place in 1896 that he completed the series of experiments leading to the discovery of the X-ray (or Röntgen ray), that has demonstrated its practical value in surgery. His publications have been limited to communications on the X-ray discovery to the Würzburg Medico-Physical Society.

ROOSEVELT, THEODORE, twenty-fifth President of the United States, succeeded to his office on September 14, 1901, after the death of his predecessor, William McKinley (*q.v.*). A native of New York City, where his family has been prominent in civil and military life for 250 years, he was born October 27, 1858. After graduating with honors at Harvard University in 1880 and traveling in Europe for a time, he began the study of law in the office of his uncle, Robert B. Roosevelt, in his native city. For three terms (1882-83-84) he was a member of the State assembly and leader of the Republican minority. In 1884 he was a delegate to the national convention of his party, and later in the year went West, where, until 1886, he followed the life of a ranchman at Medora, on the Little Missouri River. Returning to New York, he ran for mayor in 1886 against Henry George and Abram

S. Hewitt, who was elected. Appointed by President Harrison to the United States Civil Service Commission in 1889, he served until 1895, being retained by President Cleveland. In May, 1895, he became president of the metropolitan police board, and proceeded with great energy to remove abuses in the police administration. In April, 1897, he became assistant secretary of the navy, and while in that office, by his quick and comprehensive grasp of detail and the unflagging energy that has always characterized him, he rendered invaluable assistance in the preparation of the navy for the war with Spain. One of his acts was the securing of large appropriations for target practice at sea, an expenditure condemned as wasteful at the time, but one that demonstrated its wisdom during actual conflict by the accurate aim of the American gunners, which surprised naval experts throughout the world. He resigned from the Navy Department in May, 1898, to organize, with Leonard Wood (afterward governor-general of Cuba), the First United States Volunteer Cavalry for service in the Spanish-American War. Feeling himself not qualified for command, Roosevelt became lieutenant-colonel, serving next to Colonel Wood; and the regiment, popularly known as "Roosevelt's Rough Riders," was among the first to be selected for the Cuban campaign under General Shafter. In the fighting at San Juan the regiment played a prominent part, and Roosevelt was promoted to colonel for gallantry in action.

After being mustered out of the United States service, Colonel Roosevelt became the Republican candidate for governor of New York, and after a vigorous campaign, in which he covered practically every part of the State on speaking tours, he was elected by a plurality of 18,079. At the outset of his administration he devoted his attention to the investigation of the State canal system, the mismanagement of which had become a public scandal. He appointed two Democratic lawyers to assist the attorney-general in the inquiry, and the commission reported that while the \$9,000,000 appropriated for improvements during the preceding term had been expended in a manner deserving of public indignation, there was no basis for criminal prosecution, no collusion between the State authorities and the contractors having been established. Another commission, headed by General Francis V. Greene, appointed (March, 1899) to offer suggestions as to the best plan for improving the system, delivered a report calling for the expenditure of over \$60,000,000. The legislature shelved the report; but on the last day of its 1900 session, responding to the governor's appeal, appropriated \$200,000 for an engineering survey of the system and an accurate estimate of the projected improvements. Other pieces of legislation with which the governor was intimately connected by his personal supervision were the Ford bill, providing for the taxation of the franchises of gas companies, street railways, and other corporations; the Davis bill, relating to the payment of public-school teachers, placing the minimum annual salary at \$600, and providing for regular advances in compensation, according to length of service; and a measure for the improvement of the civil service, removing the majority of classified positions from the domain of political appointment and placing them under the control of the bureau. The State constabulary bill, providing for State control of the police, by means of a commissioner, with chiefs under his direction in the various cities, received the support of the governor, but was defeated through the influence of representatives from the large cities as an infringement of their municipal autonomy.

As the Republican national convention of 1900 approached, the name of Governor Roosevelt was repeatedly mentioned for the vice-presidential nomination, and his candidacy was as often denied by himself. He announced his desire to remain governor and to be reelected, in order to complete the reforms he had barely begun. On the other hand, there was evidence of an intrigue among the party leaders to remove him from New York politics, where, in the event of his renomination for governor, it was feared that the antagonism aroused by him among the farming and corporate elements, for his advocacy of the canal investigation and the Ford bill, would bring disastrous results to Republican interests. In opposition, therefore, to his expressed wish, Roosevelt was nominated for the vice-presidency by acclamation, and with William McKinley was elected in November, 1900. After performing with credit the duties of the presiding officer of the Senate, he was called upon to take the oath of office as chief magistrate upon the death of President McKinley. Immediately afterward, President Roosevelt announced his intention of maintaining unbroken the policy of his predecessor, of which the principles are: The adoption of more extensive reciprocity in the commercial relations of the United States; the abolition of all tariffs on foreign productions where protection for home industries is no longer essential; the establishment of direct lines of communication between the eastern coast of the United States and the ports of Mexico, Central and South America; the encouragement of the merchant marine; the building and completion of an Isthmian canal; the construction of a cable between this country and its new possessions in the Pacific; and the use of arbitra-

THEODORE ROOSEVELT.



tion wherever possible in disputes with foreign governments. He requested the members of the cabinet to assist his administration by retaining their portfolios, and they consented. At the end of 1901 the cabinet was the same as at the death of McKinley, with the exception of Henry C. Payne (*q.v.*), who succeeded Charles Emory Smith as postmaster-general, although it was definitely announced that Leslie M. Shaw would succeed Lyman J. Gage as secretary of the treasury.

President Roosevelt's writings include the following: *The Naval War of 1812* (1882); *Life of Thomas Hart Benton* (1887) and *Life of Gouverneur Morris* (1888), in the American Statesmen series; *Ranch Life and Hunting Trail* (1888); *History of New York City* (1891), in the Historic Towns Series; *Winning of the West* (4 vols., 1889-96); *Essays on Practical Politics* (1892); *The Wilderness Hunter* (1892); *American Political Ideals* (1897); *The Rough Riders* (1899); *Life of Oliver Cromwell* (1900); and *The Strenuous Life* (1900).

ROPER, JESSE MIMS, lieutenant-commander, U. S. N., died at Cavite, P. I., March 31, 1901. He was a native of Missouri, and was appointed to the United States Naval Academy from that State in 1868. During the Spanish-American War he commanded the converted gunboat *Mayflower* in the West Indian campaign. He was commissioned lieutenant-commander March 3, 1899, and in November of that year was placed in command of the gunboat *Petrel*, on the Asiatic station. He was suffocated while attempting to rescue a seaman in a fire on the *Petrel*.

ROSEBERY, Fifth Earl of, ARCHIBALD PHILIP PRIMROSE, the former Liberal premier of Great Britain, signalized his return to political life in December, 1901, by a speech outlining his idea of the policy the Liberals would be compelled to follow if they hoped to gain control of the government. (See GREAT BRITAIN, paragraph The Liberal Party.) Lord Rosebery was born May 7, 1847, and was educated at Eton and at Christ Church, Oxford. His first official position was that of commissioner to inquire into Scottish endowments in 1872, and in 1878-81 he was rector of Aberdeen University. In 1881-83 he served as under-secretary in the Home Office; in 1885 he was lord privy seal and chief commissioner of works; in 1886, and again in 1892-94, when the Liberals came to power, he was secretary for foreign affairs; in 1889-90 he was chairman of the London County Council, and in 1894-95 he was prime minister. He was succeeded as premier by Lord Salisbury in 1895, and his retirement from politics was announced. In 1899 he was made lord rector of Glasgow University.

ROTHSCHILD, Baron WILHELM CARL VON, German banker, died at Frankfort, January 25, 1901. He was born at Naples, May 16, 1828. When seventeen he removed to Frankfort, and upon the death of his elder brother in 1886 succeeded him as head of the local branch of the famous banking house. Baron Rothschild was a scrupulous observer of the Mosaic law in all his actions in life and a close student of the Talmud. His munificent contributions to charitable and religious causes were due to his strict observance of the Jewish principle of tithing.

ROTHWELL, RICHARD PENNEFATHER, mining engineer and editor, died in New York, April 17, 1901. He was born May 1, 1836, at Ingersoll, Ontario, and was educated at Trinity College (Toronto), Rensselaer Polytechnic Institute (Troy), and the Ecole Centrale des Mines (Paris). After engaging in the manufacture of wire rope in England, he returned to America, and from 1866 to 1873 was active as an engineer in Pennsylvania, his practice including various branches of mining, civil, and mechanical engineering. Mr. Rothwell joined the staff of the *Engineering and Mining Journal* in 1874, and subsequently became its editor-in-chief and owner. In 1893 he founded *The Mineral Industry*, an annual devoted to mining and metallurgy, for which he received a gold medal at the Paris Exposition of 1898. He was one of the founders of the American Institute of Mining Engineers, and was at one time its president. He was also a member of the American Society of Civil Engineers, and of the geological societies of London and Paris.

ROUMANIA, a constitutional monarchy of southeastern Europe. The capital is Bucharest.

Area and Population.—The kingdom comprises the two principalities of Moldavia and Wallachia and the province of Dobruja, having a combined area of 48,307 square miles and a population (in 1899) of 5,912,600, of whom 5,469,036 are native Roumanians. Bucharest, the largest city, has 282,071 inhabitants. The predominant religion is that of the Orthodox Greek Church, whose adherents number 5,408,743. Catholics and Protestants number 168,276, and Jews (*q.v.*) 269,015. Education, although nominally free and compulsory, is still in a very backward condition, and the ratio of illiteracy in 1899 was 88.4 per cent. There is a university at Bucharest, with 2,210 students, and a smaller one at Jassy. The enrollment in the primary schools is only 321,873 out of a total school population of almost 800,000.

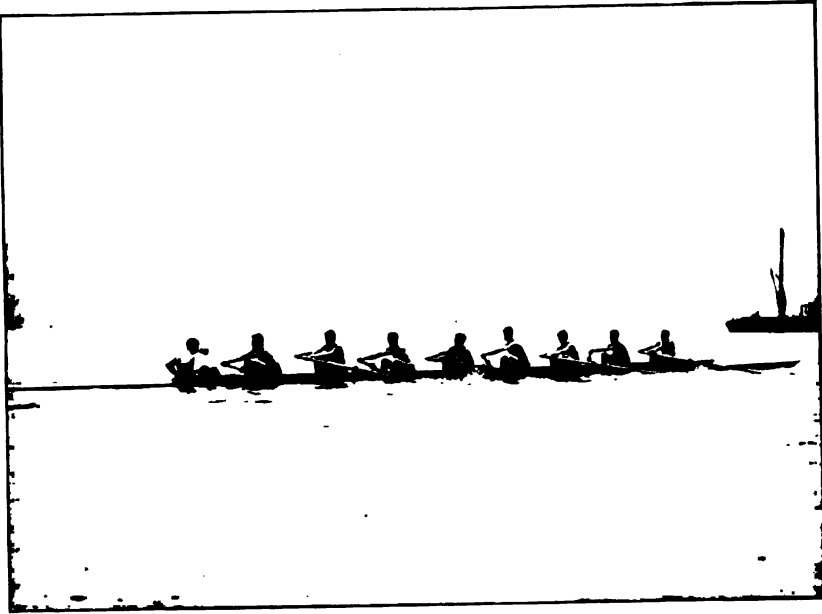
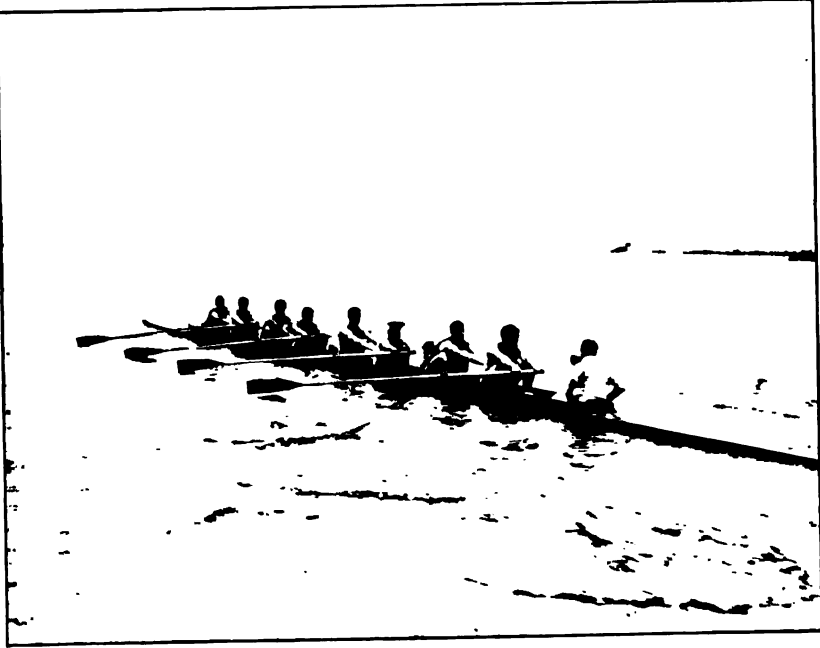
Government.—The executive power is vested in a king and a responsible cabinet of eight ministers; the legislative in a parliament consisting of two houses—the senate and chamber of deputies. The senators, 120 in number, are elected for eight years, and the deputies, of whom there are 183, for four years. The reigning sovereign is Charles I., of Hohenzollern-Sigmaringen.

The military service is organized on a basis of conscription, all Roumanians between 21 and 46 years of age being liable for personal service. There is a regular army, on a peace footing, of 3,280 officers and 60,000 men, and a territorial army of 70,000. The war strength is about 172,000. The regular army is said to be remarkably efficient. There is a small navy of a dozen vessels, containing one protected cruiser.

Finance.—The standard of value is the leu, valued at 19.3 cents. The financial situation has been for some time the most perplexing of all national problems. The principal sources of revenue consist of direct and indirect taxes, the proceeds of the sale of the state domain, and the salt and tobacco monopolies. The budget estimates for 1900-01 balanced at 245,325,400 lei. The Liberal retrenchment programme for 1901-02 reduced the budget balance to 218,500,000 lei. The public debt, which has been increased rapidly in recent years from loans, amounted to 1,292,240,030 lei at the end of 1899 and 1,451,497,307 lei in 1900. The prevailing financial stringency in the country is said to be due to poor crops, and the large indebtedness at excessive interest borne by landed property. The annual interest on this indebtedness, which averages 10 per cent. and in some cases reaches 36 per cent., amounts to 26,000,000 lei. The debt itself in 1901 was estimated at 431,000,000 lei. The per cent. for ordinary loans is 24, while peasants are often compelled to pay as high as 60.

Industries, Commerce, etc.—Over 70 per cent. of the population are engaged in agriculture, and only 25 per cent. of the entire area is unproductive. Wheat is the largest crop, the production in 1900 being 19,897,406 hectolitres. The crops of maize, barley, oats, and rye are next in importance, in the order named. The Carpathian Mountains are rich in mineral deposits, which have been little worked. The total imports decreased from 389,908,439 lei in 1898 to 333,267,938 lei in 1899 and to 216,985,876 lei in 1900, and the exports, after falling from 283,181,567 lei in 1898 to 149,119,657 lei in 1899, increased to 280,000,431 lei in 1900. The falling off in exports in 1899 was due to poor crops, which resulted in a shrinkage in the cereal export from a value of 241,415,465 lei in 1898 to 97,116,900 lei in 1899. In 1900 there were 1,932 miles of state railway in operation in Roumania, and about 440 miles more in process of construction or under survey.

History.—At the opening of the year 1901 it became apparent that a complete reorganization of the government's financial policy was necessary. Loans could be raised only with the greatest difficulty, the national credit was impaired, and the revenues were becoming more and more inadequate to meet the increasing expenditure. M. P. P. Carp, who had succeeded M. George Cantacuzene, the Old Conservative leader, as the head of a coalition ministry of Old Conservatives and Junimists (or Young Conservatives), in July, 1900, prepared an elaborate scheme for financial reform, which he laid before the chamber in January, 1901. The bill presented by Premier Carp to meet the deficit provided for an increase of existing taxes so that they would produce an additional 7,500,000 lei, and establishing new imposts that would raise as much more. Opposition immediately developed, not only among the Liberals, but in the ranks of the Old Conservatives, who thought that their leaders, M. Cantacuzene and M. Take-Jonesco, his former minister of finance, had been ignored in the preparation of the bill. M. Cantacuzene had given up his place as premier in July, 1900, to M. Carp, the Junimist leader, in the hope of preventing a return of the Liberals, who had gone out of power with the fall of the Sturdza cabinet in 1899. M. Cantacuzene himself had been chosen president of the chamber, but his chief lieutenant, M. Take-Jonesco, had refused a seat in the Carp cabinet, and many of the Old Conservatives remained dissatisfied with the coalition. The situation demanded, on the part of M. Carp, the exercise of great tact, a quality that he seems to have lacked entirely. There was nothing unreasonable in the schedules of his fiscal reform bill—in fact, it was an exceedingly moderate measure; but the Old Conservatives remained obdurate, and no efforts of M. Cantacuzene—who, although he felt the action of Premier Carp to be a direct affront to his party, still clung to the hope of a continuance of the anti-Liberal coalition—could whip them into line in support of the ministerial measure. On February 7, 1901, the financial committee of the chamber reported adversely on the premier's scheme. The following day, taking this as a practical defeat, M. Carp and his colleagues handed in their resignations. King Charles was loath to call the Liberals into power, and on February 9 asked M. Cantacuzene to undertake the task of forming a Conservative ministry. This, however, the former premier refused to do, and counseled the king to ask Carp, who had not been actually defeated, to reconsider



Rowing.—Harvard (Upper) and Yale (Lower) Crews at New London.

his resignation. The Carp cabinet, being assured by many of the Old Conservative leaders that when it came to a choice between themselves and a renewal of the Liberal régime, they would be supported by all parties to the coalition, withdrew their resignations at the king's request. Results, however, showed that the Old Conservative leaders either could not or did not try to control their party vote, for a motion of lack of confidence in the Carp ministry was carried in the chamber on February 26 by a vote of 75 to 74, whereupon the ministry again resigned. No further attempt was made to keep the coalition alive, and on February 27 the king intrusted to M. Demetri Sturdza, premier in a former Liberal cabinet, the task of forming a ministry from the Liberal party. Parliament was dissolved on March 1, 1901. At the general elections of March 26 the Liberals were victorious everywhere, obtaining control of both houses, and thus assuring parliamentary support for the Sturdza ministry. The new chambers met on April 6, when M. Palladi, the minister of finance, presented a bill embodying the Liberal remedy for the nation's financial ills. According to this bill the budget estimates were balanced at 218,500,000 lei, as against 245,325,000 lei the preceding year. Retrenchment to the amount of 25,000,000 lei was to be effected by a general reduction of official salaries, pensions, and the king's civil list. The Junimists and Old Conservatives again united in ineffectual opposition, and the bill was passed, parliament adjourning on April 10.

ROWING. The University of Pennsylvania in 1901 entered an eight-oared crew in the Royal Henley Regatta, England, and rowed the closest race yet contested by American crews in the *Grand Challenge* event. At home, the largest intercollegiate race that has been rowed for 20 years took place on the Hudson at Poughkeepsie, and Cornell, in winning the eight-oared university race, broke the world's record for four miles. All the fixed rowing regattas were unusually interesting. The first great match of the summer, the Yale-Harvard boat-race, occurred at New London, Conn., on June 27, on an ebb tide, in smooth water, with a head wind. Yale won the 4-mile varsity race for eights by a scant 2 lengths, in 23.37, Harvard's time being 23.45. The result was in doubt up to the last half mile. Yale also won the 2-mile freshman race in eights by $4\frac{1}{2}$ lengths, in 10.24 4-5, while Harvard was victorious in the 2-mile varsity race in fours by 6 lengths, in 11.49 1-5.

On July 2, at Poughkeepsie, the seventh annual regatta of the Intercollegiate Rowing Association was held. Cornell won on a strong ebb tide, smooth water, and a favoring wind, by $1\frac{1}{2}$ lengths, in 18.53 1-5, followed by Columbia, 18.58; Wisconsin, 19.06 4-5; Georgetown, 19.21; Syracuse, fifth; Pennsylvania, sixth. Cornell broke the record over this course, made by itself (19.29) in 1896. The crew holds for one year the *Varsity Challenge Cup*. Cornell also won the 2-mile varsity race in fours, in 11.39 3-5, followed by Pennsylvania, 11.42 2-5, and Columbia, 11.51 3-5. In the 2-mile freshman race in eights, Cornell, while leading at the $\frac{1}{4}$ -mile point, broke an oarlock, and in a stirring finish Pennsylvania won by a half length, in the time of 10.20 1-5, followed by Cornell, 10.23; Columbia, 10.36 1-5; and Syracuse, 10.44 2-5. Syracuse was present at a general regatta for the first time in its history, and Georgetown for the second time. Columbia, coached by the professional Hanlan, had, for the first time in years, a crew of the first rank.

At the Henley Royal Regatta, July 3, 4, and 5, the Pennsylvania crew easily won its first two heats for the *Grand Challenge Cup*, over the Thames Rowing Club and the London Rowing Club. In the final heat they were defeated in a close, exciting contest, by the Leander Rowing Club, who have won this race at every Henley regatta since 1897. The Englishmen won by one length, in the fast time of 7.04 4-5, against an adverse wind. The course is 1 mile 550 yards, and the record 6.51.

ROWLAND, HENRY AUGUSTUS, professor of physics in Johns Hopkins University, died in Baltimore, Md., April 16, 1901. He was born at Honesdale, Pa., November 27, 1848, and was educated at the Rensselaer Polytechnic Institute, Troy, N. Y., where he took the degree of C.E., in 1870. After serving for a few months as civil engineer in railway work, and teaching physics at Wooster College for a year, he returned in 1872 to the Rensselaer Institute and was made instructor, and shortly afterward assistant professor. He was called to the chair of physics at Johns Hopkins University when that institution was organized (1875), and his first duties consisted of a critical examination of European methods of instruction and research and in the purchase of suitable instruments and equipment from foreign makers. On a trip undertaken for this purpose he made the acquaintance of many scientific investigators, and was able to carry on some researches in the laboratory of Professor von Helmholtz in the University of Berlin. During his connection with Johns Hopkins, which lasted until his death, Professor Rowland was an important factor in developing the scientific spirit that has since made the institution famous throughout the educational world. In the domain of physics his work plays no small part in the scientific progress of the nineteenth century. He combined experimental skill and manipulative ingenuity with the logical and discerning mind of the

true investigator. Of his invaluable contributions to science the first to meet with critical reception and approval by European physicists was the result of experiments performed at Troy, dealing with the subjects of magnetic induction, permeability, and distribution. In his experiments at the University of Berlin, he demonstrated that an electrostatic charge, carried at a high rate of speed, has the same magnetic action as an electric current. Soon after he was settled at Baltimore he determined to investigate the mechanical equivalent of heat and repeat, with the refinements made possible by improved apparatus and methods, the experiments of Joule, in which the equivalence of heat and mechanical energy was demonstrated. These experiments, carried out with wonderful care and precision in making the thermometric and calorimetric measurements, were no less celebrated than the original work of Joule, and gave an accurate value for this important quantity. In the determination of the ohm, or unit of electrical resistance, Rowland took an important part, and made a remarkably careful determination of this unit, which was repeated and carried further at the request of the United States government, and he served on the committee of the National Academy of Sciences that formulated the specifications for the international electrical units when adopted by the United States. In spectroscopy, appreciating the advantage of using diffraction gratings for the production of a spectrum, he designed and constructed a dividing engine for their construction. Such an instrument consists of apparatus which will rule a series of lines at minute intervals on a plate of glass or speculum metal which between strokes is moved by the slightest possible amount. The carriage carrying this plate is moved by a screw whose thread must be practically perfect and its necessary errors properly corrected. Rowland's instrument was a complete success, and made possible the study of the solar spectrum on a scale hitherto untried. He devised the concave grating that has been used with such wonderful success in spectroscopy, and under his direction these gratings were made and furnished to the leading laboratories and observatories of the world. While the machine was most carefully designed, nevertheless the greatest care and skill was demanded in its operation, and it is said that with the death of Professor Rowland and that of his skilled mechanic, the construction of such gratings has become practically a lost art. With the concave grating Rowland used photographic methods to study the solar spectrum and prepared photographic maps where all the lines, from the infra red to the ultra violet, are indicated. In applied electricity, particularly with regard to alternating currents, Rowland was no less active, and his researches have had a most important part in the adoption of this form of electrical energy for industrial purposes. Though not yet in extensive use, his system of multiplex telegraphy employing synchronous motors has been thoroughly tested, and for it he received a gold medal at the Paris Exposition of 1900. His tireless energy in research, his far-reaching investigations, and his philosophical method of reaching the fundamental truths of physical science won for Professor Rowland a wealth of recognition and honors in foreign countries that has rarely come to an American. He was an honorary member of the Royal Societies of London and Edinburgh, the Royal Academy of Sciences of Berlin, the Philosophical Societies of London and Cambridge, and the Physical Society of London; corresponding member of the Royal Society of Göttingen and the Academy of Sciences of Paris, and foreign member of the Royal Swedish Academy of Stockholm. In the United States he was a member of the National Academy of Sciences, the American Institute of Electrical Engineers, the American Academy of Arts and Sciences, and president of the American Physical Society. He was the recipient of the Rumford medal of the American Academy of Arts and Sciences in 1884, the Matteucci medal in 1897, and medals of honor from the international expositions of Chicago and Paris. His degrees included that of Ph.D. from Johns Hopkins in 1880, and that of LL.D. from Yale in 1895 and from Princeton in 1896.

ROYAL ACADEMY, London, has a membership of 40 academicians, 3 honorary retired academicians, 30 associates, and 4 honorary retired associates. President (since 1896), Sir Edward John Poynter; secretary, Frederick A. Eaton.

ROYAL SOCIETY, London, had, at the close of 1901, a membership of 450 fellows and 50 foreign members. The following fellows were elected in 1901: Alfred William Alcock, M.A.; Frank Watson Dyson, M.A.; Arthur John Evans, M.A.; John Walter Gregory, D.Sc.; Captain Henry Bradwardine Jackson, R.N.; Hector Munro Macdonald, M.A.; James Mansergh, M. Inst. C. E.; Charles James Martin, M.B.; Major Ronald Ross (I.M.S.), retired; William Schlich, C.I.E.; Professor Arthur Smithells, B.Sc.; Michael R. Oldfield Thomas, F.Z.S.; William Watson, B.Sc.; William C. Dampien Whethane, M.A.; Arthur Smith Woodward, F.G.S. During the year the Copley medal was awarded to Professor J. Willard Gibbs. President, Sir William Huggins, D.C.L., LL.D.; secretary, Professor Sir M. Foster, K.C.B., M.P.; foreign secretary, Dr. I. E. Thorpe, C.B., Burlington House, Piccadilly, London, W. C.

RUBBER. About four-fifths of the rubber used in the United States is produced in Brazil. The European supply comes largely from Africa, where the Congo production is rapidly developing, though the product is as yet inferior to that of Pará. As a result the Brazilian product is being crowded out of European markets. Considerable attention is now being paid in Brazil to the proper maintenance and supervision of the rubber industry. It is believed that the rubber business in Brazil will be revolutionized by the system of new planting, as otherwise it will not be possible to meet the increasing demands for this substance from the native plants. This increase is apparent when it is realized that the total exports by way of the Amazon River, amounting to 19,144,067 kilogrammes in 1893, increased to 30,131,854 kilogrammes in 1901. A possible rival to Pará as a rubber centre is Manaus, which is the capital of Amazonas, the largest rubber producing state in the world. The exports from this town have increased from 4,743,752 kilogrammes in 1893 to 15,469,395 in 1901. The rubber industry around Manaus is being conducted on a large scale, and it is believed that the rubber lands will be placed under private control in order to secure the proper preservation of the rubber trees, and at the same time the active prosecution of the industry. In 1900 the total production along the Amazon River was about 25,807,000 kilogrammes. In 1900 the exports of rubber from Pará amounted to 15,529,932 kilogrammes. Other South American countries producing rubber are Bolivia and Peru, portions of whose product pass down the Amazon. In Mexico there has been considerable activity in rubber planting, largely owing to the advent of American capital and the systematic cultivation of the tree. Of considerable importance is the investigation of the Philippine Islands for the production of gutta-percha. Dr. Penoyer T. Sherman, of the Philippine Forestry Bureau, after an examination of these and various East Indian islands where gutta-percha is produced, expresses the opinion that this tree is to be found in the Philippines, but that if it does not exist it can be cultivated artificially, as has been done in Java. Gutta-percha, however, has already been discovered in Mindanao, and both this substance and India rubber have been exported from the Philippines. Gutta-percha, it must be remembered, plays an important part in the manufacture of submarine cables, and the development of any new fields is a matter of considerable interest. The imports of rubber and gutta-percha into the United States showed a marked increase during 1901. The imports of unmanufactured gutta-percha amounted to 410,092 pounds, valued at \$224,807, as compared with 367,465 pounds, valued at \$142,326, in 1900. In 1901, 55,142,810 pounds of rubber, valued at \$28,120,218, were imported into the United States, while in the previous year the amount was 49,337,183 pounds, valued at \$28,577,789. The exports of rubber manufactures also showed a marked gain, increasing from \$2,808,516 in 1900 to \$3,326,016 in 1901.

RUBIES. See GEMS.

RUGGLES, JAMES M., brevet brigadier-general, U. S. V., died at Havana, Ill., February 9, 1901. He was born in Ohio, March 7, 1818. As one of a legislative committee, whose other members were Abraham Lincoln and Ebenezer Peck, Ruggles is said to have drafted the platform on which the Republican party was organized in 1856. Serving through the Civil War in the Union army, he rose from the rank of lieutenant to that of lieutenant-colonel of the Third Illinois Cavalry, and was brevetted brigadier-general of volunteers.

RUSSIA, an empire occupying the northeastern part of Europe and the entire northern portion of Asia, and comprising one-seventh of the land surface of the globe. The capital is St. Petersburg.

Area and Population.—The total area is stated at 8,660,395 square miles, of which 2,095,616 are in Europe and 6,564,778 in Asia. The population in 1897 was 128,932,173, that of European Russia alone being 106,154,607. Estimates in 1901 gave the total population at over 130,000,000. Ethnically the Slavs constitute the bulk of the population, their number being estimated at something over 70,000,000, of whom 65,000,000 are Russians and 5,000,000 Poles. Other important elements in the population are Jews, who number about 4,000,000; Lithuanians, Finns, Armenians, Tartars, and a number of Asiatic races.

Government.—Russia is an absolute hereditary monarchy, the whole executive, legislative, and judicial power being vested in the czar, or emperor. The administration of the empire is intrusted to four great executive boards or councils, whose members are appointed by the emperor and responsible to him. These boards are: (1) The council of State, whose principal function is that of a consultative body on legislative matters; (2) the senate, by which all new laws must be promulgated, and which is also the supreme court of justice for the empire; (3) the holy synod, to which is committed the entire control of ecclesiastical affairs in the empire; (4) the cabinet of ministers. The empire is divided into ten general-governments (or circles), composed of various governments, or provinces, which in turn are divided into districts, the number differing according to the size of the province. The emperor is represented in every general-government by a governor-general, who has

supreme control within it, over both civil and military affairs. A civil governor, assisted by a council, exists in each government. In local government alone is there any degree of autonomy, the administration of affairs within the city, parish, and commune being largely intrusted to the people, who elect, at public assemblies, elders, tax-collectors, and other officials. Local government in Finland (*q.v.*), Poland, and the Baltic provinces differs somewhat from that in the rest of the empire. The present emperor is Nicholas II., who succeeded his father, Alexander III., on October 20, 1894. His cabinet of ministers during most of the year 1901 was constituted as follows: Minister of the imperial household and imperial domains, Baron W. Fredericksz; foreign affairs, Count Lamsdorff; war, General Kuropatkin; navy, Vice-Admiral Tyrtoff; interior, M. Sipyaghin; public instruction, M. Peter Vannovsky; finance, M. de Witte; justice, M. N. V. Muravieff; agriculture, M. Yermoloff; public works and railways, Prince Khilkoff; general control, General Lobko; procurator-general of the Holy Synod, M. Pobiedonostzeff; state secretary for Finland, Count de Plehwe.

Religion and Education.—The established church of the empire is the Græco-Russian, officially known as the Orthodox-Catholic Faith. The emperor is the head of the church, which has no connection, except that of ritual and creed, with the other branches of the Greek Church. Estimates place the number of adherents at about 96,000,000, of whom 12,000,000, however, are "dissenters." Other religious beliefs are represented approximately as follows: Roman Catholics, 12,150,000, one-half of whom live in Poland; Mohammedans, 12,000,000; Protestants, 6,750,000, and Jews, 4,000,000. With the exception of restraints placed upon the Jews, all religions may be freely professed, and all, with the exception of the Jews, are supported by the state, through the Holy Synod, or imperial department of religious affairs, whose head, the procurator, has wide powers over all denominations.

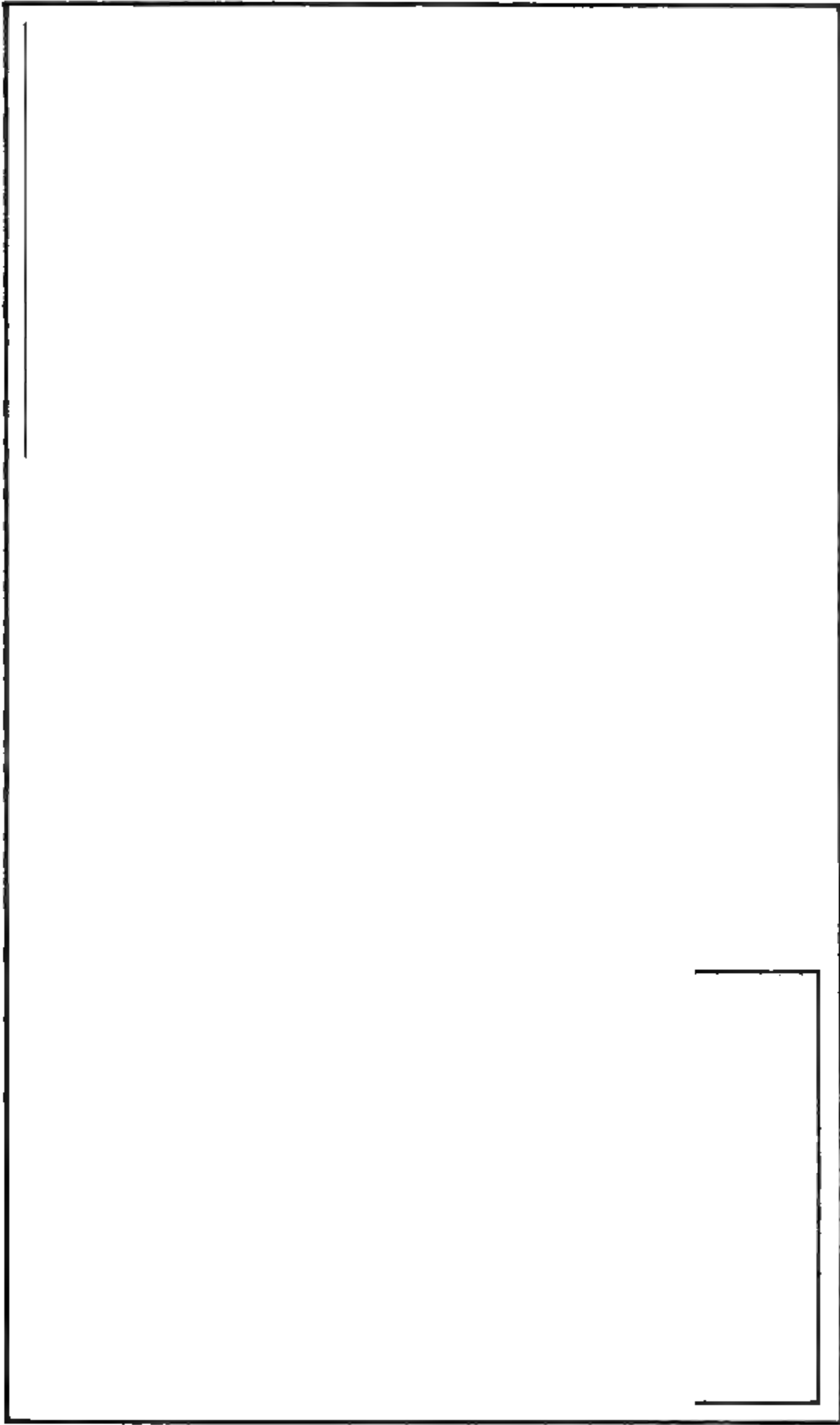
The greater part of the educational system of the empire is under control of the minister of public instruction, but there are also numerous technical schools supported by other departments, agricultural schools under the department of agriculture, and theological schools in charge of the Holy Synod. There are universities at Moscow (4,407 students), St. Petersburg (3,788 students), Kiev (2,604 students), Kharkov (1,387 students), Yuryev, Warsaw, Kazan, Odessa, and Tomsk. The estimated enrollment of students in the universities is 16,500, in middle schools (including technical, agricultural, etc.), 260,000, and in primary schools upward of 4,000,000. Both the latter grades are supported partly by the state, partly by local authorities, and partly by private fees or donations.

Army and Navy.—The Russian military service is organized on a conscriptive basis, every male above 21 years of age being liable for duty, with a few exceptions in the case of clergymen, teachers, and some other professions. Actual service for recruits in European Russia is for a first term of 5 years and a term of 13 years in the reserves, with further enrollment in the local militia until the age of 43. In Asiatic Russia, active service is for 7 instead of 5 years. Estimates of the peace footing of the regular standing army give the numbers as follows (1901): Infantry, 710,000; cavalry, 130,000; artillery, 153,000; engineers, 42,000; administration, 39,000. Total, 1,074,000. The total war establishment, including reserves and militia, numbers 63,000 officers and 3,440,000 men.

Only in very recent years has Russia possessed a navy of the first class, and even now it is nowhere nearly commensurate with her position as a world power. The geographical situation of the empire makes it necessary to maintain at least three separate fleets, for the difficulties of reinforcing one by another in war-time would be well-nigh insuperable. One fleet is bottled up in the Black Sea, where, according to international agreement, it must stay. Another is maintained in the Baltic, and a third, by far the largest and most important, in the Pacific and the China Sea. There are also squadrons in the White and Caspian seas. The Russian fleet in commission and building in 1901, not including obsolete and old wooden vessels, consisted of 13 first-class battle-ships, 11 second-class battle-ships, 1 third-class battle-ship, 15 first-class cruisers, 7 second-class cruisers, 9 torpedo gunboats, 43 torpedo-boat destroyers, and 85 first-class torpedo boats.

Finance.—The budget for 1901 balanced at 1,788,482,006 rubles, and for 1902 at 1,946,571,976 rubles. In the budget for 1902 the sum of 170,658,495 rubles is assigned for expenditures upon the Siberian and other railways. The free balance at the disposal of the imperial treasury at the close of 1901 was, according to M. de Witte, the minister of finance, 240,000,000 rubles. There was a total public debt on December 31, 1901, of 6,497,300,000 rubles. The principal sources of revenue are land taxes, trade licenses, capital taxes, excises, stamp duties, and state domain and railways.

Industries and Commerce.—Although a great portion of its territory is unfit for cultivation, Russia is preeminently an agricultural country, and at least three-quarters of its inhabitants are engaged in agricultural pursuits. The crops for 1901 were disappointing, for although in many cases the acreage under cultivation was greater



POBEDONOSTZEFF, REACTIONARY STATESMAN.

NICHOLAS II., CZAR

WITTE, MINISTER OF FINANCE.

than in 1900, the production in most staples was considerably less. According to figures furnished by the Russian Central Statistical Committee, the principal crops, in bushels, for 1901, with the decrease or increase as compared with 1900, were as follows: Rye 754,924,997, decrease 18 per cent.; wheat 427,780,266, increase 1.1 per cent.; oats 624,096,754, decrease 26.9 per cent.; barley 239,916,435, increase 1.2 per cent.; maize 68,400,394, increase 99.7 per cent.; buckwheat 36,040,495, decrease 12.6 per cent.; millet 65,553,744, decrease 10.4 per cent.; peas 17,911,488, decrease 31.3 per cent.; potatoes 879,710,734, decrease 8.6 per cent.

Hay is a product of growing importance and value. In the trans-Caucasian region tea, tobacco, and wine are produced, the latter product amounting in 1899 to over 17,000,000 gallons. Live-stock and forest products are of great value, but as industries have been but little developed. There are rich ore deposits in both European Russia and Siberia (*q.v.*), but on account of the difficulty of access to the mining country and the conservatism in introducing modern mining machinery, the development of the industry has been exceedingly backward. The government took steps in 1901 to modify the restrictions imposed on gold placer mining in the Ural Mountains, it having been found that the output from that source had been gradually diminishing during the past decade. The smelting of pig-iron in the Ural region, which began in 1891 with an output of 482,000 tons, had increased in 1900 to a total of 797,900 tons. The most successful mining in the Urals is that of platinum, about 96 per cent. of the entire world's product coming from this district, the production in 1900 amounting to 11,089 pounds. The coal output, although considerable in quantity, is of a very poor quality. In 1900 Russia supplied 35 per cent. of the petroleum on sale in the markets of the world; that is, 365,000,000 gallons out of a total of 1,035,000,000 gallons. The production of naphtha in that year amounted to 3,360,000 gallons, as against 2,105,000 gallons produced in the United States. The competition of Russian with American petroleum will doubtless grow keener with the completion of new railways and pipe lines from the oil fields to the coast. Hitherto the transportation of Russian petroleum has been effected chiefly by means of the railway from Baku to Batum, 558 miles in length, and capable of carrying 400,000,000 gallons a year. Between these two points an immense pipe line is in process of construction that will have, when completed, a carrying capacity of 625,000,000 gallons, 142.5 miles having already been completed.

In 1900 the imports were valued at 572,496,000 rubles, a slight falling off from 1899, when the value was 594,000,000 rubles. The exports, on the other hand, increased from 601,600,000 rubles in 1899 to 688,552,000 rubles in 1900. The imports and exports respectively (in rubles), with the principal commercial countries of the world, for 1900, were as follows: Germany, 215,416,000 and 187,515,000; Great Britain, 128,176,000 and 145,564,000; France, 31,228,000 and 57,444,000; Austria-Hungary, 27,290,000 and 26,436,000; Netherlands, 8,811,000 and 69,192,000; Denmark, 5,943,000 and 18,290,000. According to figures furnished by the United States Treasury Department, imports to the United States from Russia, European and Asiatic, amounted in the fiscal year 1900-01 to \$7,263,874, and exports to Russia from this country, to \$8,221,915 in the same period. The exports from Russia are largely food-stuffs, animal products and manufactured articles. During the last few years the Russian merchant marine has developed greatly. Not many years ago the merchant fleet comprised only a few steamships and about 200 Finnish sailing vessels. In 1901 the merchant steamships, including river steamers, numbered some 3,050.

Communications.—The Trans-Siberian Railway.—On November 3, 1901, the section of the Trans-Siberian Railway built westward along the Amur from Khabarovsk, north of Vladivostok, was connected with the branch built eastward from Sryetensk, and complete rail connection between St. Petersburg and Vladivostok was thus established, except for the branch road around the end of Lake Baikal. A transfer ferry carries the express trains across the lake at present. The Trans-Siberian line was begun in the spring of 1891 and was completed as far east as Irkutsk in 1898. The eastern section, however, was much the most difficult part of the work, and construction has been slow. The completed line is 5,545 miles in length, over thirty miles of the distance consisting of bridges. The trip from London to Shanghai may be made over this overland route in 21 days at a cost of about \$160. The present service provides two express trains a week from Moscow, a through ticket to Vladivostok costing about \$50, first class. The road from Nikolsk to Port Arthur was likewise completed, giving the latter place rail connection with the rest of the Trans-Siberian system. There were apparently well-founded reports in the spring of 1901 that the condition of the Trans-Siberian Railway was disappointing to the Russians because of the poor quality of work done by dishonest contractors, in collusion with government supervisors.

The railway across Russian Turkistan from Orenburg to Tashkent was begun in the fall of 1901. It will traverse for a greater part of its length a barren and

sparingly populated country. It will have a total length of 1,150 miles and will cost, it is estimated, about 115,000,000 rubles.

Canals.—Along with her plans for covering the empire with a network of railways, Russia has projected a canal system that is intended to make up to some extent for the lack of natural water connection between the various parts of the realm. In January, 1901, it was announced that the government would build a canal from the Gulf of Finland to the White Sea, and preliminary work was at once begun. The length of the waterway will be 508 miles, of which 304 miles will be formed by lakes. From the mouth of the Neva the canal will follow the bed of that river to St. Petersburg; Lake Ladoga will be utilized, whence the canal will follow the Svir to Lake Onega; thence various waterways will be used, the channels being widened and deepened, to the White Sea terminus, at Soratzkoi. The canal will have a depth of 31 feet and a surface breadth of 200 feet, thereby admitting the largest ocean steamship, and is looked upon as of great strategic as well as commercial importance. Plans were perfected during 1901 for the proposed ship canal from the Baltic to the Black Sea, a project which the Russian government has had in mind for a quarter of a century. There is already a small canal for grain barges and canal-boats. The proposed ship canal will follow this route, running from the Gulf of Riga, along the rivers Dvina, Beresina, and Dnieper to Kherson, on the Black Sea, the length being 994 miles. Early in 1901 there was a report of a project to connect the Black and Caspian seas by a canal from Astrakhan to Taganrog, on the Sea of Azof, at an estimated cost of 40,000,000 rubles. It is stated, however, that the plan has not received official sanction.

HISTORY.

Riots.—In the early months of 1901 occurred a most serious succession of riots among the students of various Russian universities. The inciting cause, apparently, differed at different times and places, but the demands of the students were very similar. As the disturbances increased the unrest spread to workmen and small shop-keepers, who, contrary to all precedent, allied themselves with the students. The movement gave rise to the greatest apprehension on the part of the imperial government, who thought they saw in the rioting the outbreaking of a spirit of revolution. Trouble first arose at the University of Kiev, as a result of a mass-meeting of students. The authorities, who objected to any student intermeddling, as they looked upon the mass-meeting, called the military to their aid; 500 students, whose names were taken, were afterward tried by special court, and 138 were condemned to one, two, or three years' service in the army. Soon after, what appeared to be sympathetic disturbances, took place among the students at the University of Moscow. The movement spread to the University of Kharkov, and thence throughout the country, bulletins and proclamations being issued and demands for reform presented to the authorities. On February 27 a student named Karpovich shot and fatally wounded M. Bogoliefpoff, the minister of education. At St. Petersburg, on March 17, a riot occurred, the cause of which is obscure, but which has been stated to have had some connection with the excommunication of Count Tolstoy (*q.v.*). The rioters, 3,000 strong, met before the cathedral, and were dispersed by Cossacks only after bloodshed. On March 23 an attempt was made to assassinate M. Pobiedonostzeff (*q.v.*). The appointment of General Vannovsky to succeed M. Bogoliefpoff as minister of education met with general approval, as it was recognized that he would be liberal in his treatment of the rebellious students, and at least give a hearing to their complaints. It was said that during the riots in March at least 2,000 of the 10,000 students at the universities at St. Petersburg, Moscow, Kiev, and Kharkov had been arrested, and most of them sentenced to military service. General Vannovsky, himself a soldier, was personally much opposed to this sort of punishment, and with the czar's approval their punishment was suspended and they were allowed to return to the universities for the fall term. A revision of the educational statutes was determined upon by the council of state, it being proposed to return to the liberal laws in effect prior to 1884.

Foreign Relations.—Russian diplomacy was chiefly occupied during the year with the Chinese settlement and the attempt to strengthen her position in Manchuria. (See CHINA, paragraph Manchurian Question.) With the United States the relations centred about the readjustment of tariff rates. (See UNITED STATES, Russian Tariff War.) For the czar's visit to France, see FRANCE. See also COREA; FINLAND; JAPAN; PERSIA; and TURKISTAN, RUSSIAN.

RUSSIAN LITERATURE. *History and Biography.*—Among the important historical publications of the year is a noteworthy *Life of the Emperor Paul*, by N. K. Shilder, already well known as author of an elaborate four-volume life of Alexander I. Shilder's work as a biographer is distinguished not only by an exhaustive industry in collecting facts, but by the special interest which he takes in the personality of his subjects, and which produces works more in the nature of psychological

monographs than contributions to scientific history. His new work is said to have the added interest due to much hitherto unpublished material. Maxim Kovalefski is still devoting himself to his exhaustive history of *The Economic Condition of Europe till the Rise of Capitalism*, the second volume of which was chronicled a year ago. *A History of Russia*, by M. Pavloff, covering the first five centuries, and based upon original research, has been brought to a conclusion, and is praised for its entertaining style. The credit, however, of having written the most voluminous of all Russian histories still belongs to Sergius Solovyoff, whose memory has recently been revived by the publication, more than twenty years after his death, of a collection of his early essays upon a variety of historical subjects. An interesting contribution to early ecclesiastical history comes from Professor Vladimir Guerrier, of the University of Moscow, in the shape of a series of essays upon *Struggles for Unity of Faith in the Fourth Century*, which show an intimate acquaintance with the writings of St. Augustine.

Literary Essays, Criticism, etc.—The young Russian novelist, Dmitri Mereshkofski, who was introduced to American readers last year through a translation of his *Death of the Gods*, is author of a rather curious piece of literary criticism, *Christ and Antichrist in Russian Literature*. Elaborating the idea which underlies his trilogy of novels—that of an eternal conflict waged in the heart of man between paganism and Christianity, egotism and altruism—Mereshkofski holds that the two paths open to humanity, the way to Christ in eastern mystic teachings and the way to Antichrist in the teachings of Nietzsche, lead to opposite sides of an impassable abyss, and Russian literature alone, in his opinion, can discover a means of bridging it over. The work is dedicated to Tolstoy and Dostoyefski, the former of whom he denounces in unsparing terms, both as a man and a teacher. M. R. Rosanov, of the University of Moscow, is author of a critical and biographical study of Jacob Lenz, based upon much hitherto unpublished material, and pronounced by some German critics to be the first adequate biography of this important poet of the *Sturm und Drang* period. Of the many reprints of the older writers, the new editions of Gogol and of the poet Maikov have proved to be of mediocre importance, and little more may be said of the collected works of Pushkin, which are being issued by the Academy of Sciences. Of very different calibre is the reprint of the works of the Empress Catherine II., which have been edited in a most thorough and scientific manner by the academician, A. N. Pypin, who discovered in the imperial library many hitherto unknown manuscripts.

Fiction.—The peculiar conditions of Russian ethics and Russian censorship have tended to give the novel an importance beyond that which it holds in other countries, since writers of earnest purpose, who have problems to discuss, not daring to present them directly are driven to the expedient of presenting them disguised in the form of fiction. The present year, however, is not distinguished by any great masterpieces in this department. Tolstoy's precarious state of health leaves little hope that the promised sequel to *Resurrection* will ever be written. Anton Chekhoff is busily engaged in editing an edition of his collected works, but the volumes which have so far appeared contain only his juvenile tales, somewhat lacking in individuality, and obviously written under the domination of Maupassant. Chekhoff's latest contribution to literature took the form not of a novel but a drama—*The Three Sisters*. It is described as a masterly presentment of the helplessness, the stagnation, the sordid misery of Russian town life, a pitiless arraignment of the intemperance, the scandal, the petty quarrels, the treachery of the men and frailty of the women. It is one more proof of Chekhoff's rare ability to give in a few brief lines an exhaustive and enduring picture. Two rising young writers, both of whom have been introduced to American readers during the past year are Mereshkofski, already mentioned, and Maxim Gorki, the exponent of Russian tramp life. *The Resurrection of the Gods*, the second of Mereshkofski's trilogy, was completed more than a year ago, and is soon to appear in English. The author is now busy upon the concluding volume, which is to have for its hero the character of Peter the Great, and will seek to show that Russia also has her share in the struggle of humanity between Christ and Antichrist. One of Gorki's recent stories is *The Trio*, a study of the lives of three boys who have grown up in a wretched alley, in close company with murderers, thieves, and prostitutes. Although these lads are imbued with noble aspirations, the pervading atmosphere of the story is that of squalor and crime; yet the spirit in which it is written is best expressed by the words of one of the characters: "Who will remember God, if it is not the sinners?" Other volumes of fiction which deserve to be chronicled are *Memoirs of a Surgeon*, by V. Veresaev, based upon the tragic errors into which a young surgeon falls at the beginning of his practice; *March 1st, 1881*, by G. Yasinski, the title referring to the day upon which Alexander II. was murdered; and a collection of entertaining Siberian tales, by Korolenko.

Poetry.—Two of the most notable volumes of recent verse in Russia are *New Songs*, by N. Minski, and *Houses of Fire*, by K. Balmont. The essence of Minski's

philosophy lies in negation; to him, beauty, truth, and God are non-existent. His *New Songs*, while perfect of their kind, are sombre creations; their burden is of autumn leaves falling into mud and dust, and soon to be wrapped beneath a pall of snow. Balmont's verse has hitherto been characterized by its tender, elusive quality, but in *Houses of Fire* he shows new and unexpected resources of phrase and vocabulary. Among the younger poets is V. Korin, who has brought out a second volume of *Flashes*, in which he has tried to embody the modern spirit of Russian poetry in strictly classic forms.

SAFFORD, TRUMAN HENRY, professor of astronomy in Williams College, died June 12, 1901, at Newark, N. J. He was born at Royalton, Vt., January 6, 1836, and as a boy showed remarkable mathematical gifts, being able to perform mentally involved problems. He graduated at Harvard in 1854, and remained there for a time as observer under Professor Bond, and later as acting director of the observatory. In 1865 he was made director of the Chicago Observatory, and worked there until the great fire caused its abandonment. After several years' service with the United States government in astronomical surveying in the West and scientific work at Washington, Professor Safford, in 1876, was called to the chair of astronomy at Williams College, which he held until his death. At Williamstown he made many important observations and computations dealing especially with star positions. He compiled several star catalogues, one of which, dealing with all the existing observations suitable for determining geographical latitudes in the United States, was published by the engineer corps of the United States Army, while a second catalogue, embracing 612, was made the basis of the boundary between the United States and Mexico, and was published in the *Report of the Mexican Boundary Commission* (Washington, 1868). In addition to these, he published the *Williams College Catalogue of North Polar Stars*. One of the most striking of Professor Safford's observations was his prediction in 1861 that the bright star Sirius has a companion star, which was then invisible. This prophecy was made as a result of intricate calculations from irregularities in the observations, and was realized in the following year by Alvan Clark, the telescope maker, when testing an 18-inch objective. Professor Safford was elected a member of the Royal Astronomical Society of London in 1866, and was also a member of the *Astronomische Gesellschaft* of Leipzig, besides other American and European scientific societies.

SAINT ANDREW, BROTHERHOOD OF, an order in the Protestant Episcopal Church, the object of which is the spread of Christianity among young men, originated in 1883, and was organized as a general church society in 1886. In the United States it has 1,500 chapters and 10,000 members in the senior brotherhood, and 500 chapters and 5,000 members in the junior department. There are similar organizations in the Anglican churches of Canada, England, Scotland, South Africa, West Indies, and Australia. *St. Andrew's Cross*, which has a circulation of 12,000, is the official organ of the American brotherhood. President, H. D. W. English; secretaries, Hubert Carleton and H. R. Scully; headquarters, 330 Sixth Avenue, Pittsburg, Pa.

ST. CHRISTOPHER, or **ST. KITTS**. See **LEEWARD ISLANDS**.

ST. LOUIS EXPOSITION. See **LOUISIANA PURCHASE EXPOSITION**.

ST. LUCIA. See **WINDWARD ISLANDS**.

ST. VINCENT. See **WINDWARD ISLANDS**.

SALAMAN, CHARLES KENSINGTON, English composer and pianist, died in London, June 24, 1901. He was born in London, March 3, 1814, and studied under Charles Neate and Rimbault, in London, and with Henri Herz in Paris. Settling in London in 1831, he founded, with others, the *Concerti da Camera* (1835), and later (1836) played in Munich and Vienna. For two years (1846-48) he lived in Rome, began to lecture on music in 1855, and founded (1858) the Musical Society of London. As a contributor to the *Concordia*, *The Musical Times*, and as critic for the *Circle*, Mr. Salaman was widely known. He was a member of a number of musical societies in England and on the Continent, and published various orchestral and vocal pieces, songs, and pianoforte compositions, some of which became favorites.

SALISBURY, EDWARD ELBRIDGE, American philologist and Oriental scholar, died at New Haven, Conn., February 5, 1901. He was born in Boston, April 6, 1814, and graduated at Yale in 1832. He went to Europe in 1836, after graduate study in the intervening four years, and studied Arabic and Sanskrit in Paris and Berlin, under De Lacy, Garcia de Tassy, and Bopp. Returning to Yale, he assumed, in 1841, the professorship of Arabic and Sanskrit there, the first one founded in the United States, and retained the position until 1856. In that year he resigned in favor of William Dwight Whitney, who had begun Oriental research under him, and he endowed the chair, previously an honorary one, in the sum of \$50,000. In 1870 the department received his splendid Oriental library and a fund to procure additions

to it. Professor Salisbury was interested in the foundation of the American Oriental Society (1842), and was at different times its secretary and president, as well as editor and chief contributor to its *Journal*, in the course of which incumbency he prepared many notable monographs and treatises on philological subjects. He was a member of many foreign antiquarian societies, and, being interested in genealogy, wrote *Family Memorials* (1886), and *Family Histories and Genealogies* (1892).

SALT. The production of salt in the United States in 1900 amounted to 20,869,342 barrels, valued at \$6,944,603, which is an increase of 6 per cent. in quantity over 1899. The statistics of the United States Geological Survey show that in 1880 the output was only 5,961,060 barrels, or about one-quarter that of 1900. In spite of this great increase, the salt-producing business has not been very flourishing. The imports in 1900 were 399,817,824 pounds, valued at \$634,307. The United States is the largest producer of salt in the world, while Great Britain is second. The domestic product came from the following States, named in the order of their output: New York, Michigan, Kansas, Ohio, Oklahoma, California, Texas, West Virginia, Utah, and Pennsylvania.

SALVADOR, the smallest American republic, lies on the Pacific coast to the south of Guatemala and Honduras. The capital is San Salvador.

Area and Population.—The area of the 14 departments comprising Salvador is 7,225 square miles. The census of January 1, 1886, showed the population to be 651,130. According to the enumeration of January 1, 1901, the approximate number of inhabitants was 915,512. There were 234,648 Indians, and almost the entire remainder were mestizos. The density of population—about 127 a square mile—is greater than that of any other American republic. The population of San Salvador is reported at 59,514. The prevailing religion is Roman Catholic. Primary education is free and nominally compulsory.

Government and Finance.—The chief executive is a president, who is assisted by a ministry, while the legislative power devolves upon a congress of deputies. The president since November, 1898, has been General Tomás Regalado. The regular army is reported to number 4,000 men. The monetary standard is silver and the unit of value the peso, which, on October 1, 1900, was worth 45.1 cents, and on October 1, 1901, 42.8 cents. The principal source of revenue is customs. The reported revenue and expenditure for 1898 amounted to 4,609,930 pesos and 5,266,638 pesos respectively; for 1900, 6,337,729 pesos and 6,751,028 pesos respectively. A balance from 1899 and certain receipts from loans made the available fund in 1900 33,723 pesos in excess of the disbursements. In 1900 the government was relieved of the foreign (English) debt by the Salvador Railway Company in consideration of the transference to the latter of the government railways. The company receives an annual subsidy. At the end of 1900 the total public debt amounted to 7,588,979 pesos.

Industries, Commerce, etc.—Agriculture is the principal industry, while to some extent mining is carried on. The most important products are coffee and sugar. Imports and exports in 1896 amounted to 3,347,718 pesos and 7,485,384 pesos respectively; in 1900 imports, about 6,000,000 pesos and exports 9,142,690 pesos. The leading imports are cotton textiles, alcoholic liquors, iron and steel ware, flour, and silks. Salvador has over 2,000 miles of good roads. The railways, after the completion of the line from Port Union to San Salvador, will have an aggregate length of 217 miles. In 1901 an official board of agriculture was established. See CENTRAL AMERICA.

SALVATION ARMY, an organization founded in London in 1865 for the purpose of extending the Gospel among the masses, and known as the Christian Mission until 1878, when its present name was adopted. It maintains a military discipline, and since its inception has organized branches in 47 countries, in which are 7,296 corps, or societies, with 15,300 officers. In the United States there are 735 corps and 2,709 officers. The Salvation Army has international headquarters in London, and headquarters for the United States at 120 West Fourteenth Street, New York City, the publication office of the weekly *War Cry* and other official periodicals. In the United States the army carries on its work through the following agencies: Shelters for homeless men, shelters for homeless women, homes for clerks and artisans, homes for girls working in stores and offices, homes for children, rescue homes for fallen women, slum posts for slum visitation and meetings, slum day nurseries for infants, cheap food depots and cent-meals, cheap clothing and second-hand stores, salvage brigades for collection of household and office waste, wood-yards, employment bureaus, Knights of Hope for prison visitation and ex-criminals, winter relief, medical relief, including free dispensaries, summer outings for the poor, penny ice wagons, Christmas and Thanksgiving dinners, Missing Friends and Inquiry department, and farm colonies for the poor. The last-named institution is worthy of particular note as affording an example of a successful and contented community.

The balance sheet for the year ending September 30, 1901, of the account of amounts handled through the national headquarters in New York City shows assets of \$1,249,345, with balance for the general income and expenditure account of \$12,155. General and commander-in-chief, William Booth, London; (United States) commander and consul, Booth-Tucker. See VOLUNTEERS OF AMERICA.

SAMFORD, WILLIAM J., governor of Alabama, died at Tuscaloosa, in that State, June 11, 1901. He was born in Georgia, in 1845, but spent his early years on a farm and in a printing office in Alabama. At seventeen he entered the Confederate army, and became a lieutenant. After the war he studied law, devoting himself in particular to constitutional-law. He entered politics as a Presidential elector in 1872, and in 1878 was sent to Congress from the third (Ala.) district. After serving several terms in the State senate, he retired from politics in 1895 to devote himself to legal practice. In 1900, however, he accepted the Democratic nomination for governor and was elected.

SAMOAN ISLANDS, a group of about a dozen islands, are situated in the southern Pacific, lying about 2,800 miles southwest of Hawaii and 1,800 miles northeast of New Zealand. They have a combined area estimated at 1,700 square miles and a population of about 36,000. The inhabitants, with the exception of about 500 English, Germans, and Americans, are Polynesians, and nominally Christian. Politically the islands are divided between Germany and the United States, the division having been made by agreement between Germany and Great Britain in November, 1899, and accepted by the United States in January, 1900. The German or eastern portion of the group includes the two largest islands, Savaii, with an area of 660 square miles and a population of 12,500, and Upolu, area 340 square miles, population 16,600. The latter island contains Apia, the capital and chief port of the former Samoan kingdom, now the residence of the German colonial governor. The estimated expenditure of German Samoa for 1901 was \$64,724, of which the sum of \$35,525 was provided by an imperial subvention, an increase of \$26,279 over the grant of the preceding year. The increase was largely due to expenditures on harbor improvements, the increased cost of administration, and the abolition of direct taxation. The trade is entirely in the hands of British, German, and American merchants and is largely with Australia. The products raised for domestic consumption and export include cotton, copra, sugar and coffee. The exports in 1899 were valued at \$442,276 and the imports at \$523,904.

The American, or western, portion of the group has a total area of less than 100 square miles and a population of about 6,000. Tutuila, the principal island (area 54 square miles, population 3,800) contains Pago Pago, the only good harbor in the islands. Manua is the only other island of any considerable size in the American portion. The islands are administered under the United States Navy Department by a naval officer acting as resident governor (since 1901 Commander Uriel Sabree). The commerce of the islands is insignificant, although Tutuila is very fertile and capable of cultivation. An important naval station is being constructed by the United States at Pago Pago.

SANFORD, GEORGE EDWARD LANGHAM SOMERSET, lieutenant-general in the British army, died at Bedford, Eng., April 27, 1901. He was born in England in 1840, and entered the Royal Engineers as a lieutenant in 1856. In 1858 he saw service in China, where, in the engagements of Nazain, Kading, and Tsing-Poo, he attracted the attention of Gordon, the English commander of the Chinese troops, who spoke of him as the "best officer he had ever met." Leaving the engineers in 1878, he entered the quartermaster-general's department, going as deputy to India in 1880. The successful dispatch of the Indian troops to the scene of war in Egypt in 1882 was due mainly to General Sanford's excellent knowledge of Egypt, gained in preparing an *Intelligence Report* upon that country as a possible theatre of military operations. From 1886 to 1893 he was director-general of military works in India, and for services in the Burmese expedition (1885-86) he was made a C. B.

SANGER, WILLIAM CARY, who was appointed assistant secretary of war, March 14, 1901, to succeed George D. Meiklejohn, resigned, was born in Brooklyn, N. Y., May 21, 1853. He was educated at the Brooklyn Polytechnic Institute and at Harvard University, where he graduated in 1874, and studied law in the office of Evarts, Southmayd & Choate, in New York City. For some years he was prominent in the National Guard of New York, serving as inspector on the staff of the major-general commanding, and in the Spanish-American War he was lieutenant-colonel of the 23d volunteer regiment of that State. He was elected a member of the New York legislature in 1895, and held office two years. He has published numerous articles on sea-coast defenses, artillery forces, and the organization and training of a national reserve, and *The Letters of an Idle Traveler*.

SANITARY ASPECTS OF GAS LIGHTING. See GAS, ILLUMINATING AND FUEL.

SANITARY LEGISLATION. See HYGIENE.

SANTO DOMINGO, or THE DOMINICAN REPUBLIC, occupies the eastern or Spanish portion of the island of Haiti, the western part being the republic of Haiti. The capital is the city of Santo Domingo.

Area and Population.—The area of the country is 18,045 square miles, and the population, according to the last official estimate (1888), was 610,000. The inhabitants, unlike those of Haiti, are largely mestizos and mulattoes, although whites and negroes are comparatively numerous. The capital has about 18,000 inhabitants. The Spanish language prevails, and the Roman Catholic is the state religion, although other forms of worship are permitted under certain restrictions. It is estimated that in 1900 there were 10,000 pupils enrolled in 300 primary schools, instruction in which is free and nominally compulsory. Technical schools, normal schools, and a professional school are also supported by the government.

Government.—The chief executive is a president, who, according to the constitution, is chosen by an electoral college for a term of four years. The legislative power devolves upon a congress of twenty-two deputies, elected for two years by a limited suffrage. The provinces and districts are administered by governors appointed by the president. The president of the republic since October, 1899, has been Señor Isidro Jimenéz, who was chosen after a successful revolution which he inaugurated following the assassination of President Heureaux.

Finance.—The finances of the country have been, since 1893, in the hands of the Santo Domingo Improvement Company, an American corporation, which had an agreement with the government for a long term of years, whereby they were to collect the revenue, pay the interest on the government bonds, and supply money for the annual budget. Early in January, 1901, the government, on the demand, it is said, of foreign bondholders, abrogated its contract with the company and assumed control of its own finances, declaring that the company had not been paying the interest on the bonds, but had been operating simply to make money for itself. The company, asserting that it had never failed to pay interest when the revenues of the republic were sufficient, appealed to Washington, but the State Department was disinclined to act. In July it was announced that a plan of arbitration had been agreed upon.

The revenue, which accrues largely from export and import duties, amounted in 1899 to about \$1,849,000, and in 1900 to more than \$2,260,000. In April, 1901, the export duties on agricultural products were abolished by act of congress, notwithstanding which it was estimated that the revenue for the year 1901 would exceed \$2,285,000. The United States gold dollar is the unit of value; but only a debased silver coinage and depreciated paper currency are in circulation.

Production, Commerce, etc.—The principal products are tobacco, cacao, coffee, logwood, mahogany, fruits, and sugar, the production of the last in 1900 being 75,403,000 pounds. The imports and exports for 1899 were reported at \$1,857,702 and \$4,539,185 respectively. The principal items of export were coffee (3,386,886 pounds) and cacao (5,807,640 pounds). There were 116 miles of railway in operation in 1900, and a considerable extension was planned during the year 1901.

Disturbances brought about in 1901 by the son of President Heureaux in the districts of Moco and LaVega were quickly put to an end by the government.

SANTOS-DUMONT, ALBERTO the aeronaut who has been experimenting with dirigible balloons since 1897, was, in October, 1901, awarded the prize of 100,000 francs offered by M. Henri Deutsch to the first aeronaut who, starting from the Aerostatic Park in Paris, should double the Eiffel Tower and return to the starting-point within half an hour. M. Santos-Dumont was born in Sao Paulo, Brazil, the son of a wealthy coffee planter, in 1873, and was educated at Rio de Janeiro. In 1891 he went to Europe, spending two years in France and England, studying the languages of these countries, and in 1894 he made a brief visit to the United States. Becoming interested in automobiling first in 1892, he took up ballooning five years later, making in all twenty ascensions in the year 1897. From that time on he devoted himself wholly to experiments in aeronautics. See AERIAL NAVIGATION.

SAPPHIRES. See GEMS.

SARAWAK. See BORNEO.

SAVINGS BANKS. The following table, prepared by the comptroller of the currency, for the fiscal year 1900-01, shows the number of depositors, aggregate deposits, and average deposit account in savings banks in each State and geographical division;

TABLE OF MUTUAL AND STOCK SAVINGS BANKS.

STATES, ETC.	1899-1900.			1900-01.		
	Number of depositors.	Amount of deposits.	Average to each depositor.	Number of depositors.	Amount of deposits.	Average to each depositor.
Maine.....	183,103	\$ 66,132,677	\$361.18	196,583	\$ 69,533,058	\$363.71
New Hampshire.....	136,544	53,896,711	394.72	134,422	57,128,616	424.80
Vermont.....	118,364	38,290,394	323.62	125,161	40,209,089	326.60
Massachusetts.....	a1,491,143	533,845,790	358.01	1,535,009	540,408,687	352.05
Rhode Island.....	142,096	73,489,633	517.18	139,884	72,330,141	520.80
Connecticut.....	393,137	174,135,196	442.94	410,342	183,781,942	447.88
Total New England States.....	2,464,377	\$ 939,790,300	\$381.36	2,538,451	\$ 963,386,503	\$379.52
New York.....	2,036,016	\$ 922,081,596	\$452.89	2,129,796	\$ 987,621,809	\$463.27
New Jersey.....	a202,682	57,886,922	286.80	211,278	63,361,439	299.90
Pennsylvania.....	a361,220	106,418,864	291.84	b366,418	113,748,461	319.14
Delaware.....	20,300	5,027,395	247.66	23,307	5,611,496	236.47
Maryland.....	171,130	87,857,276	508.09	178,740	61,250,694	348.53
District of Columbia.....	3,360	421,313	126.39	5,635	831,832	147.62
Total Eastern States.....	2,794,708	\$1,148,691,366	\$411.02	2,902,168	\$1,232,325,780	\$424.62
West Virginia.....	12,369	\$ 1,926,407	158.74	4,728	\$ 563,264	\$119.13
North Carolina.....	a8,560	1,717,188	200.84	12,171	2,096,463	172.26
South Carolina.....	a25,150	5,068,451	202.24	23,164	5,785,792	249.78
Florida.....	877	225,395	267.01	d	d	d
Louisiana.....	10,518	3,284,892	312.31	d	d	d
Texas.....	2,980	584,424	196.12	d	d	d
Tennessee.....	19,687	2,015,472	102.37	19,823	3,519,333	177.54
Total Southern States.....	80,131	\$ 14,840,199	\$185.20	59,886	\$ 11,964,842	\$199.79
Ohio.....	a99,592	\$ 44,535,975	\$447.18	90,803	\$ 43,672,493	\$480.96
Indiana.....	21,091	5,650,961	267.93	22,354	6,561,464	293.53
Illinois.....	b208,992	c74,777,036	309.95	b256,916	c80,250,287	309.95
Wisconsin.....	2,946	568,187	192.33	3,896	634,236	187.37
Minnesota.....	51,418	12,066,170	234.67	56,179	13,961,616	248.52
Iowa.....	b160,773	58,208,115	362.06	b203,227	73,578,268	362.06
Total Middle States.....	544,811	\$ 185,806,444	\$341.05	634,864	\$ 218,659,364	\$344.42
California.....	b216,534	\$ 158,167,462	\$730.45	b223,354	\$ 170,758,091	\$764.52
Utah.....	6,522	2,252,124	345.31	d	d	d
Total Pacific States.....	223,056	\$ 160,419,586	\$719.19	223,354	\$ 170,758,091	\$764.52
Total United States.....	6,107,063	\$2,449,547,885	\$401.10	6,368,723	\$2,597,094,580	\$408.30

a Partially estimated.

b Estimated.

c Savings deposits in State institutions having savings departments—abstract of reports included with State banks.

d No report received by the Comptroller of the Currency.

Savings Banks of the World.—The following table compiled by M. Guillaume Fatio, and appearing in May, 1901, in the *Bulletin de Statistique*, shows for year ending December 31, 1899, the total number of depositors in the savings banks of the 22 principal countries of the world, the total deposits, by millions of francs, the size of the average individual deposit account, the average individual account, the average deposit per inhabitant, and in a few countries the rates of interest paid to depositors.

SAVINGS BANKS OF THE WORLD.

Country.	Number of depositors.	Total deposits.	Average deposit account.	Average deposit per inhabitant.	Rate of interest.
		Francs.	Francs.	Francs.	Per cent.
Russia (in Europe).....	2,160,000	1,069	504.30	10.25	
United States.....	5,688,000	11,553.3	2,031.15	155.10	
Germany.....	13,500,000	9,600	710.80	188.20	4 to 5
Japan.....	3,001,000	286.5	88.80	5.95	
Austria-Hungary.....	5,421,000	6,006.2	1,107.95	135.40	
Great Britain.....	8,767,000	4,145.1	470.55	103.10	2.5
France.....	9,665,000	4,271.1	441.90	110.90	2.5 to 3
Italy.....	4,976,000	2,144.4	431.35	68.20	
Spain.....	212,000	151.3	713.65	8.75	
Belgium.....	2,753,000	1,046	380.00	158.80	2 to 3
Roumania.....	113,000	31.6	279.75	5.80	

Country.	Number of depositors.	Total deposits.	Average deposit account.	Average deposit per inhabitant.	Rate of interest.
		<i>Francs.</i>	<i>Francs.</i>	<i>Francs.</i>	<i>Per cent.</i>
Canada.....	176,000	299.4	1,701.20	56.55	.....
Holland.....	925,000	271.1	293.00	54.15	.....
Sweden.....	1,664,000	629.4	378.20	126.80	3 to 6
Portugal.....	(a)	62.4	(a)	12.70	.....
Australia.....	1,013,000	775.7	766.60	183.00	.....
Switzerland.....	1,300,000	1,000	799.20	325.30	3.5
Bulgaria.....	41,000	3.6	86.80	1.45	.....
Greece.....	5,000	3.8	751.60	1.55	.....
Servia.....	11,000	8.3	753.20	3.60	.....
Denmark.....	1,063,000	897.2	844.00	389.40	3 to 4
Norway.....	616,000	384.3	624.80	185.80	3.5
Total and averages.....	63,070,000	44,541.7	706.23	8.90	.....

a No information.

See BANKS-BANKING; NATIONAL BANKS; STATE BANKS; TRUST AND LOAN COMPANIES; PRIVATE BANKS.

SAXE-WEIMAR-EISENACH, CHARLES ALEXANDER, Grand Duke of, died at Weimar, January 5, 1901. He was born there June 24, 1818, the son of the hereditary Grand Duke Charles Frederick of Saxe-Weimar and the hereditary Grand Duchess Maria Paulowna, an imperial grand duchess of Russia. He succeeded to the title at his father's death in 1853. In his administration the new grand duke instituted radical internal reforms and a strong foreign policy, and on the German question stood firmly for unification and the supremacy of the Prussian house. He was intimately connected with the reigning family, being brother-in-law to Emperor William I., and therefore great-granduncle of the present emperor. The grand duke was a liberal patron of science and art, and the friend of Liszt, Hans von Bülow, and Berlioz. His greatest achievements were the magnificent restoration of Wartburg and the founding at Weimar of an art school and museum. He married, in 1842, Wilhelmina Marie Sophia Louise, Princess of the Netherlands.

SCARTAZZINI, JOHANNES ANDREAS, Dante scholar, died at Fahrwangen, in the Swiss Alps, February 11, 1901. He was born at Bondo, Switzerland, December 30, 1837, and was educated at Basle and Berne, where he studied philology and theology. For a time he was pastor of a small church in the canton of Berne, and in 1781 he became professor of the Italian language and literature at the canton school of Schur. Four years later he was made pastor of the church at Soglio, removing to Fahrwangen, in the canton of Aargau, in 1884. His greatest reputation was won, not as a clergyman, but as a student of Dante, on which subject he published a number of important works. Among these should be mentioned *Dante Alighieri: His Times, Life and Work* (1869); an edition of the *Divina Comedia*, with commentaries (1874); *Dante in Germania* (1880); *Essays on Dante* (1880); *Dante: Vita e Opere* (1883); a *Dante Hand-Book* (1892); and *Enciclopedia Dantesca* (1895). He also edited Tasso's *Gerusalemme Liberata* (1871) and Petrarch's *Canzoniere* (1883).

SCHLEY COURT OF INQUIRY. During 1901 the controversy dealing with the fixing of responsibility for various events occurring at the naval battle off Santiago, in the Spanish-American War of 1898, and throughout the campaign leading up to it, was terminated by an investigation instituted by Secretary of the Navy John D. Long. After the engagement on July 3, 1898, in which the Spanish fleet under Admiral Cervera was destroyed by an American squadron, Commodore (now Rear-Admiral) Winfield Scott Schley, the senior American officer present, was censured in the official report of the campaign for disobedience of orders and for official misconduct during the campaign. The press immediately took sides on the question, and for three years afterward fomented a controversy that eventually subordinated the cardinal facts, and by going to extreme lengths in praise or condemnation of Commodore Schley, distorted the debate until it became an issue dealing with Schley's personal courage and that of Rear-Admiral William T. Sampson, commander-in-chief of the North Atlantic squadron during the Spanish War, and, as such, ranking Schley in the Santiago campaign. The placing of credit for the American victory also took a leading place in the discussion. The contention was brought to focus in July, 1901, by the publication of the third volume of a *History of the Navy*, in which the author, Edgar Stanton Maclay, condemned without reserve the conduct of Schley at Santiago. In response to a note from Schley (July 22) requesting such action as would "bring this entire matter under discussion," Secretary Long appointed a court of inquiry (July 25), consisting of Admiral George Dewey, president; Rear-Admiral Lewis A. Kimberley (retired), and Rear-Admiral Andrew K. Benham (retired), with orders to convene in Washington on September 12. Later Admiral Kimberley was excused on account of ill-health, and Rear-Admiral Henry

L. Howison (retired), was appointed to succeed him. The navy was represented by Judge Advocate-General Samuel C. Lemly, and Admiral Schley by Attorney-General Isidor Rayner, of Maryland; Captain James Parker; and ex-Judge Jere M. Wilson, who died during the inquiry. The precept governing the inquiry consisted of ten counts, which may be summarized as follows: (1) The conduct of Commodore Schley during the events of the Santiago campaign. (2) The circumstances attending the movements of the Flying Squadron off Cienfuegos in May, 1898. (3) The circumstances attending the movements of the squadron in proceeding from Cienfuegos to Santiago. (4) The circumstances attending the arrival of the squadron off Santiago, and the reasons for its retrograde movement westward and departure from that port. (5) The reasons for Commodore Schley's disregard of orders from the Navy Department contained in the dispatch of May 25, 1898. (6) The condition of the coal supply of the squadron on or about May 27, 1898; the reasons for the return of the squadron to Key West for coal; and the accuracy of Schley's report concerning this matter. (7) Whether every possible effort was made to capture or destroy the Spanish cruiser *Colon* as she lay at anchor at the mouth of Santiago Harbor from May 27 to May 31, 1898; the propriety of engaging the batteries at the entrance to the harbor and the vessels at anchor within the harbor, at the ranges used; and the conduct of Commodore Schley at that time. (8) The reasons for withdrawing at night the squadron from the entrance of the harbor; the character and extent of such a movement; whether an effective blockade was established; and the propriety of Schley's conduct at that time. (9) The position of the *Brooklyn* (Schley's flagship) on the morning of the battle; the circumstances attending the alleged turn of that vessel; the danger of colliding with other vessels of the blockading squadron by such a turn; and the propriety of Schley's conduct at that time. (10) The incidents of the controversy between Commodore Schley and Lieutenant A. C. Hodgson (navigator of the *Brooklyn*) relative to the alleged turn of that vessel; the colloquy at the time and the subsequent correspondence between those two officers; and the propriety of Schley's conduct in the case.

At the first session of the court, counsel for Schley challenged the competency of Admiral Howison to serve, on account of expressed views disparaging the official and personal conduct of the applicant. The court sustained the objection, and Rear-Admiral Francis M. Ramsay (retired) was selected to succeed Admiral Howison. After an adjournment, the court reconvened on September 21, and from that date until November 7 heard the testimony of more than 75 witnesses, including almost all the officers of advanced standing who participated in the Santiago campaign. Their depositions established the following facts, relating the story of Commodore Schley's connection with the campaign: On May 19, 1898, the Flying Squadron left Key West (Fla.) with orders to proceed to Cienfuegos with the utmost dispatch, to capture the enemy there, or to establish and maintain a close blockade of the port. Arriving at Cienfuegos on the 22d, the squadron established a blockade, and on the 23d, at 8.15 A.M., a dispatch was received from the commander-in-chief, stating that Commander McCalla (in charge of the marines) had found a good landing-place near Cienfuegos; that the Cuban forces were in a position to know what was going on inside the harbor; and directing Commodore Schley to communicate with them. On the 24th information was obtained that the enemy was not at Cienfuegos, and on that night, in accordance with Schley's dispatch of the 23d, the squadron sailed for Santiago. On the way one of the vessels—the *Eagle*—was in distress, and the squadron reduced its speed to allow the *Eagle* to remain with it. Later the engines of the collier *Merrimac* were temporarily disabled, which was a further reason for proceeding slowly. On the evening of the 26th the squadron, while within 22 miles of Santiago, reversed its course and sailed for Key West for coal. After sailing slowly and drifting, being delayed by accidents, the squadron was joined by the *Harvard* on May 27, and Commodore Schley received a department dispatch, dated May 25, stating that information showed the enemy to be at Santiago; ordering the squadron to proceed there without delay, and to report the situation at once. In response, Schley sent word that owing to the short supply of coal and the inability to coal at sea on account of adverse weather conditions, it was impossible to remain off Santiago. Testimony, on the other hand, showed that the weather between May 26 and June 1 was favorable for coaling at sea; that as a matter of fact coaling at sea had taken place during that period; and that the supply of coal on hand was more than sufficient. The squadron arrived at Santiago on the evening of the 28th, and established a blockade. The next morning the *Colon* and other vessels of the Spanish fleet were discovered lying about 1,200 yards within the harbor, and on the 31st the vessels of the American squadron sailed past the harbor, engaging the enemy's ships and shore batteries at ranges varying from 7,000 to 11,000 yards. During June a blockade was maintained at a distance of between 6 and 7 miles from shore in the daytime, and somewhat closer

at night. At night, also, two vessels performed picket duty two miles within the line of the remainder of the squadron. This, after Schley had set his line of vessels farther out to sea, and Admiral Sampson, upon taking command in person (June 1), had changed the plan to the one here described. On July 3 the enemy was discovered steaming out of the harbor. At that time the *Brooklyn* was headed almost due north, toward the entrance of the harbor, and directly in front of the leading Spanish vessel, the *Maria Teresa*. After firing one shot from her forward turret she engaged with her port battery, and then turned hard to starboard, executing a movement that caused the nearest American vessel, the *Texas*, to reverse her engines in order to avoid a collision. Continuing her starboard movement, the *Brooklyn* completed a turn which brought her course due westward, and in this direction she took up the pursuit of the enemy, the last of whose ships had by that time passed her. At the time of the turn a conversation took place between Commodore Schley and Lieutenant Hodgson, navigator of the *Brooklyn*, in which the former was alleged to have said, in regard to the close proximity of the *Texas*, that the *Texas* could "look out for herself." Later, Lieutenant Hodgson, in correspondence with Schley, denied that such a remark had been made; but Schley, while publishing that letter, withheld another that confirmed the statement as substantially correct.

On December 13 the court delivered its report to Secretary Long. The opinion was signed by all the members, and, in addition, Admiral Dewey submitted an opinion dissenting in some of the specifications. The majority report expressed the opinion that Commodore Schley was self-possessed during the battle of Santiago, and encouraged by his own example the men of his command to fight courageously, but condemned him on every specification of the precept. It found: That his conduct in the campaign prior to June 1 was "marked by vacillation, dilatoriness, and lack of enterprise"; that he should have proceeded to Cienfuegos with all possible dispatch; should have maintained a close blockade; and should have endeavored on May 23 to learn the position of the enemy by communicating with the insurgents, as directed by the dispatch received at 8.15 on that date; that he should have proceeded with all possible dispatch from Cienfuegos to Santiago, and should not have waited for the *Eagle*; that he should not have made the retrograde movement westward after almost reaching Santiago; that he should have obeyed the department dispatch of May 25 with promptness; that he should have tried to capture or destroy the enemy's vessels at anchor in Santiago Harbor on May 29 and 30; that his official reports concerning the coal supply and coaling facilities of the squadron were "inaccurate and misleading"; that he did not do all in his power to capture or destroy the *Colon* and other vessels which he attacked on May 31; that by beginning the engagement on July 3 with his port battery, and by the subsequent turning of the *Brooklyn*, he caused her to lose position with reference to the enemy; that the turn of the *Brooklyn* was made in order to remove her from a dangerous proximity to the Spanish vessels; that he was unjust to Lieutenant Hodgson in publishing only a portion of the correspondence that passed between them. Admiral Dewey, in his report, upheld Schley in some minor specifications, maintaining that he proceeded to Cienfuegos as quickly as possible and established an effective blockade there; that the passage from Cienfuegos to a point near Santiago was made as quickly as was consistent with Schley's plan to keep the squadron a unit; that the blockade of Santiago was effective; that he was in command at the battle of Santiago, and therefore entitled to all the credit of victory. Counsel for Schley filed a bill of exceptions to the majority report, and Admiral Sampson presented an objection to Admiral Dewey's report, particularly in regard to the question of command, evidence on which had been excluded from the court. On December 21 Secretary Long reviewed the findings of the court and approved the majority report in all particulars, at the same time agreeing in its suggestion that, in view of the length of time that had elapsed since the battle of Santiago, no further proceedings be held.

SCHMIDT, JOHANNES, German philologist, died in Berlin, July 4, 1901. He was born at Prenzlau, Prussia, July 29, 1843, and was educated at the universities of Bonn and Jena, graduating in 1865. In 1868 he became docent in comparative philology at Bonn, and five years later was advanced to an adjunct professorship. He was in the same year (1873) called to the university professorship of comparative philology at Gratz, Austria, and from there he went in 1876 to the University of Berlin, to fill the chair of Indo-Germanic philology. This position he held at the time of his death. His contributions to the knowledge of the Indo-Germanic languages and to the comparative grammar of this group are numerous. The first important theory advanced by Dr. Schmidt that attracted general attention was the "wave theory," bearing upon the dialectic disintegration of the parent speech, especially in relation to the differentiations of the various Indo-Germanic groups. This was in direct opposition to the hypothesis of mere migratory development of languages from the original linguistic stock, as maintained by Schleicher and other philologists. Dr.

Schmidt advanced these views in his treatise published in 1872 under the title *Die Verwandtschaftsverhältnisse der indogermanischen Sprachen*. Important, also, was his work on the formation of neuter nouns in the Indo-Germanic group, published in 1889 as *Die Pluralbildungen der indogermanischen Neutra*. Among his other publications may be mentioned *Die Urheimath der indogermanen und das europäische Zahlssystem* (1890) and *Kritik der Sonantentheorie* (1895), written in opposition to Brugmann's theory of vocalic nasal sounds. He was one of the editors of *Kuhn's Zeitschrift für vergleichende Sprachforschung* from 1875 until the time of his death, and contributed frequently to it.

SCHOOLS. The total enrollment in the common schools of the United States in the year 1899-1900 was 15,341,320, almost equally divided between males and females. The total average attendance in the same year shows an increase of about 125,000 over the preceding year. The proportion of the enrollment to the total school population in 1899-1900 was 68.93 per cent., as compared with 68.1 per cent. in 1889-90, and 65.5 per cent. in 1879-80. The private elementary schools had an estimated enrollment of over 1,200,000, or less than 8 per cent. of the total enrollment in the elementary schools of the country in 1899-1900. The statistics for the education of the colored race in the sixteen former slave States and the District of Columbia show that out of an estimated school population of nearly 3,000,000 in 1899-1900, only 51.46 per cent. were enrolled in the public schools, while the proportion of white children enrolled to the total school population for the same year was 68.28 per cent. The total number of teachers in the primary schools increased from 415,660 to 421,288 during the year, while the male teachers decreased from 131,793, or 31.7 per cent. in 1899 to 127,529, or 30.3 per cent. in 1899-1900. The total expenditures on schools show an increase of from \$197,281,603 in 1899 to \$213,274,000 in 1899-1900. The expenditure per pupil (average attendance) shows an extraordinary increase of from \$18.99 to \$20.29 for the same year. The total number of students receiving secondary instruction in all the public and private institutions in 1899-1900 was 719,241, including 402,032 female students, and showing an increase of nearly 65,000 over the preceding year. The increase in the number of secondary students for the last decade of the nineteenth century was over 139 per cent. in public institutions and only about 30 per cent. in private institutions. For statistics by States, see table on opposite page.

See EDUCATION IN THE UNITED STATES; NORMAL SCHOOLS; PROFESSIONAL SCHOOLS, UNIVERSITIES AND COLLEGES.

SCHOTT, CHARLES ANTHONY, assistant in the United States Coast and Geodetic Survey, and for many years chief of the computing division, died at Washington, D. C., August 1, 1901. He was born at Mannheim, Baden, August 7, 1826, and was educated at the Polytechnic School at Karlsruhe, where he received the degree of C. E. in 1847. In the following year he came to the United States, and in 1850 became permanently attached to the computing division of the Coast Survey, and served as its chief from 1855 until 1899. In the field Mr. Schott was in charge of expeditions from time to time, and he was appointed to supervise the magnetic work of the survey as early as 1855. In 1863 he was engaged in the surveys for the defense of Washington, and in 1869 he was in charge of a party in Illinois engaged in observing the total eclipse of the sun. He was also a member of a party sent from the survey to Sicily to observe the solar eclipse in 1870. In 1899 the Coast Survey completed its great work of measuring an arc of longitude extending across the continent, and to Mr. Schott was assigned the task of discussing the various measurements which had been made in this connection during the last quarter of a century. Beginning with 1869, he published nearly every year, in the annual report of the superintendent of the Coast and Geodetic Survey, interesting scientific memoirs describing and discussing magnetic observation in the United States. For this work, which the Academy of France considered the most important in the history of terrestrial magnetism, he received in 1899 the Wilde prize of 4,000 francs from that body. He was a member of the National Academy of Sciences from 1872, and a founder of the Washington Academy of Sciences. Mr. Schott's scientific work, which was as extensive as it was valuable, was published for the most part in the various reports and bulletins of the Coast and Geodetic Survey.

SCHUR, WILHELM, professor of practical astronomy at Göttingen, died July 2, 1901. He was born April 15, 1846, and at an early age became interested in astronomical work at the Altona Observatory, then under the direction of a relative, Dr. Carl Petersen. He studied at Kiel, Göttingen, and Berlin, being appointed at the Geodetic Institute in the latter city. In 1873 he was called to Strasburg by Winnicke, and was soon after made an observer. He accompanied Professor Seeliger's expedition to the Auckland Islands to observe the transit of Venus of 1874. In 1886 Dr. Schur was called to Göttingen, where he rebuilt the observatory and carried on much important work. He was best known among astronomers for his researches with

	Average attendance of common schools in 1899-1900.	Total Number of Students in High Schools (1899-1900).		State school expenditures (1899-1900).	Average Exp. per pupil (1899-1900).
		Public.	Private.		
Maine	97,697	8,749	2,389	\$1,712,795	\$17.53
New Hampshire	47,733	3,704	2,600	1,051,265	22.02
Vermont	47,020	3,438	1,035	1,074,222	22.85
Massachusetts	366,136	35,944	5,911	13,826,243	37.76
Rhode Island	46,087	3,450	634	1,570,895	34.09
Connecticut	111,564	8,107	2,809	3,189,249	28.58
New York	857,488	62,366	11,105	33,421,491	38.97
New Jersey	203,003	11,260	3,898	6,142,520	30.26
Pennsylvania	854,640	32,387	10,395	21,476,995	25.12
<i>North Atlantic Division..</i>	<i>2,631,368</i>	<i>169,405</i>	<i>40,776</i>	<i>\$83,465,675</i>	<i>\$31.72</i>
Delaware	22,693	1,052	303	\$275,000	\$13.99
Maryland	132,685	3,956	2,314	2,912,527	21.95
District of Columbia	35,463	3,431	807	1,228,133	34.63
Virginia	203,136	4,330	3,602	1,971,264	9.70
West Virginia	151,254	1,955	965	3,215,321	21.27
North Carolina	206,918	943	6,487	931,143	4.34
South Carolina	201,295	3,998	1,739	894,004	4.44
Georgia	298,237	5,845	3,737	1,980,016	6.64
Florida	75,003	1,503	248	765,777	10.21
<i>South Atlantic Division..</i>	<i>1,326,684</i>	<i>27,013</i>	<i>20,202</i>	<i>\$14,173,185</i>	<i>\$10.68</i>
Kentucky	308,697	5,517	4,085	\$2,650,190	\$8.58
Tennessee	338,566	5,422	5,649	1,751,047	5.17
Alabama	297,805	3,817	2,365	923,464	3.10
Mississippi	201,593	4,052	1,977	1,306,186	6.48
Louisiana	146,323	2,215	1,282	1,135,125	7.76
Texas	393,780	14,929	4,909	4,469,014	11.35
Arkansas	195,401	3,224	1,373	1,369,810	7.01
Oklahoma	63,718	336	20	686,095	10.77
Indian Territory .....	.....	157	381	.....	....
<i>South Central Division...</i>	<i>1,945,883</i>	<i>39,669</i>	<i>22,041</i>	<i>\$14,290,931</i>	<i>\$7.34</i>
Ohio	616,365	45,712	2,634	\$13,335,211	\$21.63
Indiana	429,566	26,415	2,213	8,188,089	19.28
Illinois	737,576	37,446	3,525	17,757,145	24.07
Michigan	359,000	28,811	1,175	6,539,146	18.68
Wisconsin	309,800	20,626	1,462	5,493,370	17.73
Minnesota	243,224	12,310	1,847	5,630,013	23.15
Iowa	364,409	29,022	2,198	7,978,060	21.89
Missouri	460,012	20,666	4,508	7,816,050	16.99
North Dakota	43,560	1,130	103	1,440,892	33.08
South Dakota	68,000	2,617	307	1,598,757	23.51
Nebraska	181,874	15,208	684	4,403,222	24.22
Kansas	261,783	14,413	918	4,622,364	17.66
<i>North Central Division..</i>	<i>4,066,169</i>	<i>254,816</i>	<i>21,574</i>	<i>\$84,802,319</i>	<i>\$20.85</i>
Montana	24,100	1,635	66	\$854,069	\$35.44
Wyoming	10,160	357	...	253,551	24.95
Colorado	73,291	5,910	197	2,793,648	38.12
New Mexico	22,433	243	103	343,429	15.31
Arizona	10,177	172	43	299,730	29.45
Utah	50,595	1,115	1,616	1,073,586	21.21
Nevada	4,698	431	.....	224,622	47.81
Idaho	21,962	486	177	400,043	18.22
Washington	64,192	3,463	526	1,795,795	27.98
Oregon	64,411	1,916	706	1,594,420	24.75
California	197,395	12,620	2,680	6,909,351	35.00
<i>Western Division.....</i>	<i>543,414</i>	<i>28,348</i>	<i>6,204</i>	<i>\$16,542,244</i>	<i>\$30.44</i>
United States	10,513,518	519,251	110,797	\$213,274,354	\$20.29

the heliometer, and was considered one of the greatest authorities on this instrument. He also spent much time in collecting and reducing many old observations which are likely to prove of great value.

SCHWAB, CHARLES M., American steel manufacturer and president of the United States Steel Corporation (*q.v.*), since its formation in 1901. He was born at Williamsburg, Pa., April 18, 1862, and was educated at the village school and St. Francis College at Loretto, Pa. He entered the employ of the Carnegie Steel Company in 1880, as a stake-driver in the engineering corps of the Edgar Thompson Steel Works, and rose rapidly, until in 1887 he was superintendent of the Homestead works. In 1892 he became the superintendent of both the Homestead and Thompson works, and in 1896 president of the Carnegie Company. Mr. Schwab has built a Catholic church at Loretto, Pa., and an industrial school at Homestead, Pa.

SCHWARZHOFF, JULIUS KARL VON GROSS VON, major-general in the German army, died at Peking, China, April 17, 1901. He was born at Magdeburg, Germany, in 1850. Prior to his appointment as chief of staff to Count von Waldersee in China in 1900, he commanded the thirty-third infantry brigade in Schwerin. He served as a member of the German delegation to the peace conference at The Hague in 1899, and was one of the active opponents of the universal disarmament plan. He went to China with Count von Waldersee upon the latter's taking command of the allied forces at Peking, and there lost his life in the accidental burning of the Winter Palace.

SCHWEINITZ, General HANS LOTHAR VON, German soldier and diplomat, died at Kassel, Germany, June 23, 1901. He was born December 30, 1822, and entered the army in 1840. He served as adjutant to Prince Frederick William of Prussia (1857), as military attaché at St. Petersburg (1860) and later (1865) military secretary, and as ambassador of Prussia (1869) and of Germany (1871) to Vienna. In 1876 he was appointed ambassador at St. Petersburg, and during the sixteen years that he held this post did much to establish friendly relations between Germany and and Russia.

SCIENCES, NATIONAL ACADEMY OF, was incorporated by act of Congress March 3, 1863, and, in conformity with the terms of the act of incorporation, "shall, whenever called upon by any department of the government, investigate, examine, experiment, and report on any subject of science or art, the actual expense . . . to be paid from appropriations which may be made for the purpose." The annual meeting of the academy is held at Washington on the third Tuesday in April, with an autumn meeting at such times as the council may fix upon. The membership at the close of 1901 numbered 89, with 28 foreign associates. Newly elected members in 1901 were: James McKeen Cattell, psychologist; Eliakim Hastings Moore, physician and surgeon; Edward Leamington Nichols, physicist; Theophil Mitchell Prudden, physician. President of the academy, Alexander Agassiz, Cambridge, Mass.; foreign secretary, Ira Remsen, Baltimore, Md.; home secretary, Arnold Hague, Washington, D. C.

SCIENTIFIC EXPEDITIONS. See ZOOLOGICAL EXPEDITIONS AND STATIONS.

SCOTLAND. See GREAT BRITAIN; for the exposition at Glasgow, see GLASGOW EXPOSITION.

SCOTLAND, CHURCH OF, the Established Church, a member of the Anglican communion, though Presbyterian in polity, being governed supremely by a general assembly which convenes annually in Edinburgh. The ecclesiastical divisions comprise 16 synods, 84 presbyteries, and 1,590 congregations, with 1,800 ministers and 661,629 communicants, a membership exceeding the combined total of all other Presbyterian bodies in the land. Receipts for home and missionary purposes during 1901 exceeded \$2,500,000. The church maintains successful foreign missions in India and Africa, and has 145 missionaries. Lord high commissioner (representing the crown) for 1901, the Earl of Leven and Melville; moderator of the general assembly, Rt. Rev. James Mitchell, D.D., South Leith.

SCOTLAND, UNITED FREE CHURCH OF, similar to the Established Church in polity and doctrine, but different in being entirely separate from the state, was organized in 1900 by a union of the Free Church of Scotland and the United Presbyterian Church. Official statistics for the new organization are not yet available; but according to combined reports of the individual churches, the united body has 1,656 congregations and 40 preaching stations, with 1,772 ministers and nearly 500,000 communicants, included in 11 synods and 64 presbyteries. An extensive foreign missionary work is carried on, extending over 15 fields and including 153 stations and 673 out-stations, in which there are over 2,650 European and

native workers and a church membership of 42,133. Connected with this work are 8 colleges and 668 schools, with an enrollment of 57,677 pupils. Considerably more than half a million dollars is devoted to missionary enterprises.

Free Church of Scotland.—A minority party of anti-unionists announced, on the event of union, their intention of disputing at law the rights of the United Church to the property and funds of the Free Church of Scotland, basing their own claims as consistent adherents of certain tenets of the Free Church which, as they proposed, were abrogated by union with the United Presbyterian Church. The action, when brought, was dismissed, the decision being entirely in favor of the defendants. The Free Church, as thus constituted of the dissentient minority, claims 92 congregations and about 100,000 adherents.

SCULPTURE. American sculpture for the year 1901 may be said to have been concentrated in the exhibits and the decorations of the buildings and grounds at the Pan-American Exposition (*q.v.*) at Buffalo. The external profusion of symbolic figures and allegorical groups, however, made the more serious and enduring work in the galleries appear comparatively feeble. There were upward of two hundred gallery exhibits, thoroughly representative of the best work of American masters. Sixty-one native sculptors were represented by works in clay or marble. Among the exhibitors were the well-known names of Augustus Saint Gaudens, Daniel C. French, Paul W. Bartlett, Frederick MacMonnies, Herbert Adams, George Grey Barnard, Charles Grafly, H. A. MacNeil, Phimister Proctor, Janet Scudder, Bessie Potter Vonnah, etc. The more important figures and groups at the exposition included representations of "Peace and Power," by Karl Bitter and by Augustus Lukeman; eight statues in niches, representing "Truth" by G. E. Bissell, "Justice" by H. K. Bush-Brown, "Liberty" by C. F. Hamann, "Hospitality" by John Gelert, "Tolerance" by Albert Jaegers, "Courage" by Herman Matzen, "Benevolence" by Gustav Gerlasch, and "Patriotism" by John S. Hartley; a figure of "Phœbus" (on the electric tower), by Herbert Adams; "The Great Waters in the Days of the Indians" and "The Great Waters in the Days of the White Man," by George Grey Barnard; "Genius of Progress," by Philip Martiny; spandrels representing the four rivers, Niagara, Buffalo, St. Lawrence, and St. Clair, by Adolph A. Weinman; seated figures representing the six lakes, Erie, Huron, St. Clair, Ontario, Superior, and Michigan, by Carl G. Tefft, Henry Baerer, Ralph Goddard, Louis A. Gudebrod, and Philip Martiny; groups in the temple of music, by Isidore Konti; the government building was decorated with four medallions by U. S. J. Dunbar, an escutcheon by Austin Hays, quadriga by F. Wellington Ruckstuhl; two fountains by William Couper, two figures by John Donoghue, figure by Maximilian Schwarzott, and a group by William Ordway Partridge. H. A. MacNeil contributed the four groups of the races—"White," "Black," "Red," "Yellow"—to the ethnological building. To the court of fountains Chas. A. Lopez contributed the large groups of "Science," "Art," "Manufacture," and "Agriculture"; Paul W. Bartlett, "The Genius of Man" and "Human Intellect" and "Human Emotions"; Tonnetti, "The Birth of Venus" and the "Birth of Athene"; and Philip Martiny, "Abundance."

Besides classified sections at the various fine arts exhibitions, detailed under **PAINTING** (*q.v.*), the purely sculptural exhibition of the year 1901 was the special exhibition in New York, in December, of works in marble, bronze, plaster, and clay, at the rooms of the Art Students' League, in the American Fine Arts building, 215 West Fifty-seventh Street. Among notable American sculptures of the year are: "Philanthropy," by G. C. Bissell, a monument of chaste and effective beauty erected to Baron and Baroness de Hirsch in Central Park, New York City; two statues, by Daniel Chester French, for the Hunt Memorial on Fifth Avenue, New York, opposite the Lenox Library; and the same sculptor's beautiful and dignified figures, "Truth," "Prudence," "Bounty," "Wisdom," "Courage," and "Integrity," for the new State capitol at St. Paul. Also noteworthy are the Boston Library decorations; the memorial tablet by Charles R. Lamb (the designer of the Dewey arch), unveiled in November to mark the site of Fort Washington, New York City; "The New Life," by F. Edwin Elwell; and "The Digger," by Charles J. Mulligan.

The chief feature in the British world of sculpture in 1901 was the national memorial to Queen Victoria. On July 25 the executive committee recommended the acceptance of Mr. Brock's design, subject to certain modifications. Mr. Brock's memorial as designed will be 60 feet high, and will rise from a platform elevated 8 feet from the ground. The platform, over 100 feet in diameter, will be flanked by water basins. Steps lead to the pedestal in the centre, the base of a pyramidal structure crowned with a great winged figure of "Victory," and seated figures of "Constancy" and "Courage" at her feet. A stately figure of the queen sits below, facing the Mall. About the columns are groups representing "Justice," "Truth," and "Charity." A general treatment of the site has been designed by Mr. Aston Webb. See **ARCHITECTURE**.

The principal event of the Alfred Millennium (*q.v.*) was the unveiling by Lord Rosebery of Mr. Hamo Thornycroft's colossal bronze statue typifying the great monarch, in the Broadway, Winchester. Other notable British sculpture of the year were the Manchester memorial group, by the late Onslow Ford; a bust of Queen Victoria, by Mr. Brock (both at the Royal Academy summer exhibition); a bronze portrait bust of Lord Overton, by F. Derwent Wood; "Dawn," a relief panel, by J. Crosland McClure; and a statuette of G. F. Watts, R.A., by Louis R. Deuchars.

In Germany the chief sculptural event was the national memorial to Prince Bismarck, unveiled at Berlin on June 16. The memorial presented a colossal bronze statue of the great chancellor, in his familiar cuirassier uniform, and in a striking and characteristic attitude, on a pedestal of granite. At his feet are various colossal figures representing "Atlas" with the world on his shoulders, the "Muse of History," "Germania Trampling on a Dragon," and "Siegfried Forging the Sword." The monument and its platform occupies a space over fifty yards square, the platform supporting fountains and basins on either side of the statue, with allegorical figures reclining on the edge of the basins. The inscriptions are: On the front of the pedestal the one word, "Bismarck"; on the back, "Dem ersten Reichskanzler—das Deutsche Volk, 1901." Other notable German sculpture for 1901 were the models for decorative purposes of Albert Reimann, and new works by Hermann Hultsch, of Dresden.

Outside the splendid work and exhibits of the Paris Ecole des Beaux Arts and the salons, notable French sculpture included a memorial of Rosa Bonheur, unveiled at Fontainebleau in May, the gift of Señor Gambart, Spanish consul at Nice. The memorial represented a bronze bull reproduced from one of the artist's paintings, with bas-reliefs on the pedestal giving her portrait and representations of three of her principal paintings. The *prix d'exécution* for a statue of Colonel Villebois-Mareuil at Nantes was awarded to Messrs. Verlet, sculptor, and Deglane, architect. In Russia, Paul Troubetzkoy (*q.v.*), professor of sculpture at the Academy of Fine Arts, Moscow, won the competition thrown open to the world for an equestrian statue of the late emperor, Alexander III., soon to be erected at St. Petersburg. In Austria, among numerous beautiful bronzes produced in the Vienna atelier of Mr. Gurschner and his pupils, was a large and noteworthy group entitled "Love and Envy." In Brussels, at the Cercle Artistique, Mr. V. Rousseau, the most interesting personality in the young Belgian school of sculpture, gave a successful and much-appreciated exhibition of beautiful bronze groups. In Italy, the gold medal, valued at 1,000 lire, of the Gregorian competition, instituted by Pope Gregory XVI., in 1831, was awarded to Ezio Ceccarelli, of Florence, for his "Noli me Tangere," descriptive of the scene in which Mary Magdalene appears to Christ after his resurrection. During 1901 the admirable figures of Antonio Ugo, of Palermo, revealed the colorist as well as the sculptor. For the remarkable recovery of a cargo of ancient statues and other works of art supposed to be those described by Lucian, see *ARCHAEOLOGY* (paragraph Greece). The 1901 necrology of sculptors includes the well-known names of Paul de Vigne, of Belgium, and Edward Onslow Ford, R.A. (*q.v.*), of England.

SENEGAL, a French colony of West Africa, originally had an area of 80,000 square miles; but in 1899 territories to the southward were transferred from the government of the French Soudan, so that the present area is estimated at 200,000 square miles, and the population is computed at 3,200,000. Four communes of the colony—St. Louis, Dekar, Goree, and Rufisque—are under the direct administration of the governor-general of West Africa. The other portions of the French possessions have been divided into nine administrative circles, each under an officer subordinate to the governor. Adjacent countries directly under the protection of the French include 1,000,000 inhabitants. The seat of government is St. Louis. The colony is rapidly becoming prosperous; the local budget for 1900 balanced at 4,454,611 francs; and whereas the expenditure of the home government on the colony for that year was 5,686,205 francs, the estimated expenditure for 1901 was only 1,154,960 francs. The main exports, which amounted in 1899 to 23,725,000 francs, consist of gum, rubber, gold, castor-oil beans, coconuts, and kola. One of the chief products of the country is peanuts, of which 125,000 tons were produced in 1899. The imports the same year amounted to 52,425,000 francs. Among the native industries are weaving and the manufacture of pottery, bricks, and jewelry. In 1898 there were 246 miles of railway in the territory and 574 miles of telegraph, with 1,022 miles of wire and 21 offices. In the rainy season there is a steamboat service up the Senegal River from St. Louis to Kayes, a distance of about 570 miles.

SERAO, MATILDE, Italian author, whose story, *Il Paese di Cuccagna* (*The Land of Cockayne*), was translated into English in 1901, was born at Patras, Greece, July 3, 1856, but early in life she removed to Naples, Italy, and there married

Edvardo Scarfoglio, with whom she founded the *Corriere di Roma* (changed to *Corriere di Napoli*), and, in 1891, the *Mattino*. She has been connected editorially with the *Capitan Fracassa*, and has written short sketches for the Neapolitan press. In her novels she has adopted the style of the French realists, notably Zola, whose idea and title she borrowed in her *Ventre di Napoli*. It is in the development of details, in which her power of observation is best shown, that she gains her effects. She is bold in her treatment of the sex problem, and in her later novels she displays a noticeable attention to the psychological development of her characters. Among the best-known of her works are: *La Conquista di Roma* (1885), *Fantasia*, *Cuore Inferno*, *Addio Amore*, *Il Castigo*, *Gli Amanti*, and *Fior di Passione*. Another of her novels that has been translated into English bears the title *The Ballet Dancer*.

SERUM THERAPY. Immunity is a condition of protection against the contagion or infection of a disease. Certain persons, as well as certain families, possess natural immunity, and certain tribes possess racial immunity, as the Arabs against typhoid fever. Some animals possess immunity against diseases, as the dog against tuberculosis, or the fowls, rats, and pigeons against anthrax. Acquired immunity is obtained by passing through an attack of a disease, or by being inoculated with weak cultures of the germs of the disease. Immunity is acquired after suffering with smallpox, scarlet fever, or measles. One of the duties of the white blood corpuscle is to destroy bacteria. Such action is called phagocytosis, and through such action certain people are immune to a given disease. During the course of a disease caused by bacterial infection, toxins are developed by or exist in the bodies of the bacteria. In nature's combat with the disease, certain principles are developed in the blood serum of the sick person which tend to neutralize the toxins, and these are termed anti-toxins. The knowledge of this fact is utilized by inoculating animals with a certain disease, and after changes have taken place in their blood its serum is taken and injected hypodermically into the tissues of human beings to protect the latter against "taking" the certain disease, or to antagonize the toxic action of the causative bacteria during an attack of the disease. The use of blood serum in this way is called serum therapy. Diphtheria, anthrax, typhoid fever, yellow fever, bubonic plague, and pneumonia are among the diseases which have been treated or combated by serum therapy. In preparing serum for this use the same general methods are employed in various productions. The following description of the preparation of anti-pneumococcic serum will serve as an example of the process. Violent bouillon cultures of pneumococci (the bacteria of pneumonia) are injected into a horse, after the organisms in the cultures have been killed by prolonged heating at 60° C. After the animal has obtained a certain amount of tolerance to these injections, living cultures of pneumococci are injected in increasing quantities until such injections fail to show constitutional symptoms. Rabbits are infected with living pneumococci meanwhile. From time to time the horse serum is injected into these rabbits. When the serum of the horse is found by experiment to protect rabbits so that infection does not occur after injection of living pneumococci, it is withdrawn from the horse for use, preserved with an antiseptic and bottled. Payne and De Renzi, of Naples, used anti-pneumococcic serum in 1896, and from time to time others have experimented with it. Wilson and Page, in the *Therapeutic Monthly*, July, 1901, published notes on 17 cases in which this serum was used. Of these 6 died, giving a mortality of 35.3 per cent. In four of the fatal cases no history was obtainable, but two were known to be alcoholics. In one fatal case, treatment was delayed until the fifth day; in another until the tenth. Tyler, of Denver, Col., reports 141 other cases of pneumonia treated with this serum. Of these, 121 recovered and 20 died, showing a mortality of 14.18 per cent. Of the fatal cases, one was emphysematous, one was 78 years old, one died of cardiac disease during convalescence, one died on the third day with a solid right lung, one had been ill with la grippe for 2 weeks, and 9 were alcoholics. Excluding these cases, the mortality was 4.7 per cent. Vadeboncoeur, of Syracuse, N. Y., reported in 1901 17 cases of pneumonia treated with serum without a death. The usual mortality from pneumonia in cases not treated with serum, varies from 20 to 40 per cent. The use of the serum is no longer in the experimental stage, but it is limited to cases of lobar pneumonia, and early and large doses are necessary. A new serum for tetanus was announced in 1901 by its discoverer, Dr. A. Leteve, of the pathological department of Mercy Hospital, Pittsburg, Pa. After a year's experimentation with lower animals, he used the serum with success in three cases of tetanus in human beings, all of whom recovered in six days. Loeffler and Uhlenhuth, of Austria, announced in 1901 the discovery of a serum which they claim protects animals against the foot-and-mouth disease, securing immunity to them for from four to eight weeks. A serum for use in cases of malignant tumor, and still in the experimental stage, was exploited by Louis Dor, of France, in 1901. It is apparently successful in cases of sarcoma. Reynier, of France, published, early in 1901, the results of injections of a new serum in the cases of patients with carcinoma. His serum is that obtained by Wlaeff by inoculating

birds with blastomycetes isolated from human cancers, with apparent improvement. Truneck, of France, has given the name "inorganic serum" to a solution that he uses in cases of arterio-sclerosis. It is composed of sulphate of sodium, chloride of sodium, phosphate of sodium, carbonate of sodium, sulphate of potassium, and distilled water. His theory is that this compound will increase the alkalinity of the blood and cause a solution of the phosphatic deposits upon the arterial walls, as well as increase organic function, especially of the heart and blood vessels. See SMALLPOX AND VACCINATION, and YELLOW FEVER.

SERVIA, formerly an autonomous Turkish province, but now an independent kingdom, lies south of Hungary, between Bosnia and Bulgaria. The capital is Belgrade.

Area and Population.—The sixteen provinces comprising Serbia have a total area of 19,050 square miles, and a population in 1901 estimated at 2,500,000. Over four-fifths are Servians (Slavs), the remainder being mostly Roumanians and Gypsies. Belgrade, the largest city, had in 1901 about 72,000 inhabitants. The state church is the Greek Orthodox, of which most of the inhabitants are adherents. Primary education is normally compulsory, and to a certain extent free. Probably 80 per cent. of the inhabitants are illiterate; children, however, are included in this figure.

Government.—The executive power is vested in the king, assisted by a council of eight responsible ministers; the legislative in the king in conjunction with the Narodna-Skupstina, or national assembly. A senate, which is continuously in session, consists of 16 members, half nominated by the king and half chosen by the assembly. The delegates to the assembly number 262. Of these, 64 are appointed by the king and 198 elected by a suffrage based on tax-paying. The ruling sovereign is Alexander I., who became king in 1893. A new constitution, embodying some changes in the structure of the government, was promulgated on April 6, 1901 (see paragraph History).

Military service is compulsory for all Servians above the age of 21 years. The service required is 2 years in the active army, 8 years in the reserve, and thereafter enrollment in the national militia for a period of 20 years. The active army numbered, in 1901, 22,448 officers and men, and the total strength of the mobilized regular army and its reserve was placed at 160,751. The war strength of Serbia is estimated at about 353,000 men. There is no navy.

Finance.—The standard of value is the dinar (dinar = 1 franc, 19.3 cents). The revenue is derived largely from direct taxes, monopolies, public works, customs, and excise. The budget for 1902 showed an estimated revenue of 72,820,000 dinars, as compared with 74,018,070 dinars in 1901, and an expenditure of 72,815,000 dinars, as compared with 73,992,543 dinars in 1901. There was considerable retrenchment, especially in the proposed expenditure for the ministry of war. Serbia has a public debt amounting to 424,725,713 dinars. The National Bank of the Kingdom of Serbia, at Belgrade, with a nominal capital of 20,000,000 dinars, has a monopoly of the issue of bank notes, of which, on January 1, 1901, there were 35,900,000 dinars in circulation, secured by a gold and silver reserve of 15,800,000 dinars.

Industry and Commerce.—Serbia is an agricultural country, the cultivation being largely by peasant proprietors with small holdings. Maize, wheat, oats, and barley are the principal cereal products. The largest of all crops are those of meadow-grass and plums. Tobacco, grapevines, and various fruits are also cultivated with great success, and the value and size of all the crops is increasing enormously year by year. Agriculture is fostered by the government, which has established agricultural colleges and laboratories, and introduced new and improved methods. The mineral resources of the country are considerable and of increasing value. Coal, iron, lead, silver, zinc, quicksilver, copper, and gold are mined. Among manufacturing industries, the drying and canning of fruit products is one of the most extensive, and flour-milling and brewing are growing in importance. The foreign trade in 1899 surpassed that of any former year, the imports amounting to 46,428,600 dinars and the exports to 65,744,388 dinars, a remarkable increase in the past five years, the imports in 1895 being only 28,239,715 dinars and the exports 43,390,451 dinars. Sixty per cent. of the trade is with Germany and Austria-Hungary.

Communications.—Serbia has one principal railway line, 230 miles in length, running from Belgrade, via Nisch, to Vrania. Branch lines bring the total mileage up to 387. Several new lines have been projected, and some are already in process of construction.

History.—The year 1901 was one of great political changes in Serbia. The expectation that an heir was to be born to Queen Draga was not realized, and there were reports that the pro-Russian party had invented the story of the expected birth for political purposes, a rumor which seems to have had no foundation in fact. Early in the year the ministry secured the passage of several pieces of legislation of

considerable importance, among others an army-reform act reducing the term of active service from 2 to 1½ years, and a judiciary-reform act, providing that judges shall hereafter hold office for life or during good behavior. In February appeared the first signs that a change was taking place in the policy of the king. On February 18 the cabinet of M. Jovanovitch was reconstructed, the premier himself relinquishing the portfolio of foreign affairs to Dr. Michael Vuitch, and taking in its place that of justice. Two other changes were made in the cabinet, with the result that the Radical element was strengthened at the expense of the Progressist. The change was one which had been imminent for some time. Of the three political parties in Servia, the Radicals, whose great strength was in the agricultural districts, and the Liberals, who comprised the educated townspeople, showed an unmistakable Russophile tendency. The Progressists, who had supported King Milan (*q.v.*) in his pro-Austrian policy, had continued this policy after his abdication. The death of Milan on February 11 had weakened their position, and their political antagonists were not slow to take advantage of it. On April 3 M. Jovanovitch resigned his position as prime minister, and Dr. Vuitch, the recognized leader of the Radicals, was made premier. The cabinet was still further reconstructed, the Radical element being again strengthened. On April 6 King Alexander proclaimed a new constitution, after consulting with his ministers. The new constitution approached more nearly the liberal constitution of 1888 than the old constitution of 1869. There was an evident attempt at securing a more complete balance of power between the executive and legislative branches than that existing under the old constitution. On many points the power of the king was increased, and on others more clearly defined. A system of a two-chamber legislature was constituted, the lower house to be elective, the upper, composed of 30 appointive and 18 elective members, to be controlled by the king and to maintain a certain right of veto over the legislation of the lower house. The throne was made hereditary through the female as well as the male line. The king's right of decrees was much curtailed. In May two of the Progressist members in the cabinet were replaced by Radicals. In August the first elections under the new constitution took place, the result being a complete victory for the ministry. The supporters of the government elected 110 members to the lower house, of whom 84 were Radicals and 16 Independent Radicals. The Progressists returned only 26 members, and the Liberals, once a powerful party, only 6. The latter were for the most part aligned with the Radicals on all matters of foreign policy, and were counted upon to support the ministry. Of the 30 senators appointed by the king, 11 were Radicals, 10 Progressists, 4 Liberals, and 5 neutrals. From this time on the change in Servian foreign policy became more marked, and the pro-Russian policy was more openly championed. The disappointment over the failure of Queen Draga to fulfill the hopes of the Servian people and provide an heir to the throne threatened for a short time to precipitate a crisis, and caused something of a set-back to the pro-Russian propaganda. It was reported from St. Petersburg during the summer of 1901 that the Russian government was attempting to bring Servia, Bulgaria, and Montenegro together in a triple alliance, to offset the pro-Austrian policy of Roumania in the Balkan peninsula. Later reports asserted that Russia itself was desirous of concluding an alliance with Servia, the terms of which should remain secret, but by which it was understood that the Servian army in war time would be placed at the disposal of Russia, and in return the perpetual independence of the Servian kingdom should be guaranteed by Russia. The convention was also to provide, it was said, that in case of a partition of the Ottoman empire Russia would insist on Servia being given an increase of territory by the addition to the kingdom of the sanjak of Novi-Bazar and part of Macedonia. The reports of such a convention were so persistent that Premier Vuitch finally found it necessary to deny absolutely its truth.

SEWAGE PURIFICATION. Those American cities and towns which some years ago adopted intermittent filtration or broad irrigation as a means for purifying their sewage have, for the most part, continued to find such methods satisfactory, and other municipalities have followed their examples with equally good results. At Plainfield, N. J., however, a variety of considerations, largely local in character, led to the construction of septic tanks and contact filter beds in 1901. Some of the old sand filter beds were used as sites for the new works, while the remaining sand beds can be continued in use, either as before, or to receive the effluent from the septic tank. The latter was put in use during the last quarter of the year, but the beds were not completed before the year closed. At Worcester, Mass., the old chemical precipitation plant has been supplemented by quite a large area of intermittent filter beds. A chemical precipitation plant, the largest yet built in America, has been put in operation at Providence, R. I. The masonry work throughout was very largely of concrete. As the effluent here is discharged into a large volume of tide-water, at a point quite remote from the centres of popular

tion, a high degree of purification is unnecessary, and it is believed that chemical precipitation alone will be sufficient. In England many communities, large and small, are still experimenting with septic tanks and other so-called bacterial filter beds. Numerous installations of septic tanks, combined with some of the filtration systems, and of the latter alone, have been made. Conservative American engineers do not consider that either the experimental plants abroad or those in practical everyday use have yet demonstrated their economic efficiency. The same class of engineers also express doubt regarding the possibility of operating the larger areas of septic tanks for a city of considerable size without complaints on account of odors, more particularly from the tank effluent when exposed to the air for aëration and subsequent application on filter beds.

Many septic tanks and quite a number of bacterial filter beds have been installed in the United States and in Canada; but, like those abroad, they are all connected with the sewerage systems of relatively small towns, or, as is more often the case, with public and semi-public institutions. Among the municipal septic tank installations reported in 1901 may be mentioned those at Madison, Wis., Glencoe and Lake Forest, Ill., Wauwatosa, Wis., and Glennville, O. All but the Glencoe plants are operated in connection with contact or sand filter beds. It may be explained that a septic tank is merely a long, narrow masonry reservoir, through which the sewage flows slowly. The inlets and outlets are below the surface. The sewage, in passing, deposits a large part of the suspended matters. These, as far as they are organic, are acted upon and broken down by anaerobic bacteria, or those that thrive best where a minimum of oxygen is present. Some of the matter thus reduced finally escapes in gaseous form, some is carried by the sewage effluent from the tank in a finely divided and more or less liquid state, and a relatively small amount remains, with the mineral matter in the bottom of the tank. The effluent, relieved of nearly all the mineral contents and a considerable portion of its organic matter, and with the latter partly reduced or digested, is readily disposed of by dilution where a high degree of purification is not required, or where there is a relatively large volume of water to receive it. If neither of these two conditions prevail, it may be further purified by intermittent sand filtration, which is also a bacterial process, or by more concentrated bacterial action in some of the contact or bacterial filter beds. In the contact beds, crushed cinders, coke, or stone are employed. The sewage is admitted to these beds and remains in the interstices of this material for two or more hours. Meanwhile, the bacteria left on the surface of the stone from the last treatment, or contained in the sewage itself, carry on the work of purification. Double contact beds employ first coarse, then finer, material, there being two separate contacts or processes. These contact beds may be used alone, or in combination with chemical precipitation, as well as with septic tanks. Intermittent sand filtration beds are composed of sand which, in comparison with the foregoing, is relatively fine. The sewage filters through the beds continuously for a number of hours, or for several days, then is turned off to give the beds a rest.

SEWELL, WILLIAM JOYCE, United States senator from New Jersey, died at Camden, N. J., December 27, 1901. He was born at Castlebar, Ireland, December 6, 1835, and came to this country in 1851. For some years he followed the sea, as a sailor before the mast, and at the outbreak of the Civil War joined the Union army as captain of the Fifth New Jersey regiment of volunteers. At the battle of Chancellorsville he distinguished himself by capturing eight stands of colors and retaking the flag of a New York regiment. For this he was in 1866 brevetted brigadier-general of volunteers. He was afterwards brevetted major-general. At the close of the war he went into business in New Jersey and became prominent in railroad affairs. He was elected to the State senate in 1872, serving until 1881, and acting as president of that body in 1876, 1879, and 1880. In the United States Senate he served from 1881 to 1887, from 1895 to 1901, and was elected again shortly before his death for another term. General Sewell was a man of great force, and an excellent parliamentarian.

SEWERAGE. The most notable features of sewerage construction continue to be the introduction of new works and the extension of old systems in cities or districts previously without sewerage facilities; and steps to prevent nuisances from the pollution of water by sewage. Many cities and towns of fair size, and a few of our largest cities, are still without sewers for the removal of house and manufacturing wastes. Included in this class are Baltimore and New Orleans, in each of which a sanitary sewerage system is now being agitated. Baltimore has some large and costly storm sewers, designed to remove street drainage only, while New Orleans is improving its old system of drainage canals, from which ground water and the surface water discharged from the streets are pumped. In the latter part of 1901 the Municipal Art Society of Baltimore resumed the agita-

tion, begun a number of years ago, for sanitary sewers. Two reports by a board of engineers were made a few years ago, and it is probable that the general plans therein recommended will soon be authorized. At New Orleans a sewerage franchise was granted to a private company some ten years ago. After much delay it began to construct sewers for house wastes, but financial and other difficulties stopped the work. The city now has authority to raise \$12,000,000 for sewers, the completion of the drainage canal and pumping system, and the acquisition and improvement of the water-works plant, or the building of new works. A commission was engaged on studies and plans for these improvements throughout the year 1901. Late in the same year a board of engineers reported to the New Jersey Sewerage Commission a plan for a great trunk sewer to divert the sewage of the lower Passaic Valley from the Passaic River, which for some years has been polluted. The sewer would serve the cities of Paterson, Passaic, Orange, and Newark, besides a number of smaller towns. The sewer would extend from Paterson to and across Newark Bay, and also across the Bayonne peninsula, below Jersey City, and out to Robbin's Reef, in Upper New York Bay, where it would discharge into water 70 feet deep. The total length of the sewer would be about 20 miles. All the sewage would be lifted 40 feet by pumps located at Newark Bay. The sewer would have a capacity of 270,000,000 gallons a day below Newark, but the pumping plant and portions, at least, of the outfall sewer beyond the pumping station, would be designed to handle 100,000,000 gallons a day at the outlet. The estimated cost of the system, as outlined, is \$7,000,000. At Birmingham, Ala., a commission is working on plans for joint outlet sewers to serve the various municipalities composing Jefferson County. There being no large volume of water suitable for disposal by dilution here, as there is in the Passaic Valley case, purification works will doubtless be required. The Chicago Drainage Canal, designed to divert the sewage of Chicago from Lake Michigan to the Mississippi Valley, continued in operation during the year. St. Louis has brought suit for an injunction against the discharge of Chicago crude sewage by its doors, on the ground that its water supply is polluted thereby. Chicago and St. Louis are conducting a series of analytical tests to show the effect of the drainage canal on the river below. For purification works, as contrasted with long outfall sewers to secure inoffensive sewage disposal by dilution, see SEWAGE PURIFICATION.

SHAKERS, known also as the Millennial Church, or United Society of Believers, is the oldest existing communistic society in the United States, the first community in this country having been organized at New Lebanon, N. Y., in 1787. The Shakers have 11 schools, serving as do the common schools of the State, and subject to State inspection, 12 meeting houses, 17 persons (male and female) that "stand in the order of ministry," and 1,200 or 1,300 communicants. In each family, the administrative unit, there is a hall devoted to family gatherings for religious devotion. The families, from one to four in number, according to numerical strength and convenience of administration, are organized into societies, as many as four of which may be constituted under the care of one ministry. A full ministry consists of two persons of each sex, and a "full lot" of elders, the heads of the families, is of like composition. At the present time most of the ministries are not full, though the central ministry (New York) is a complete order. There are now 30 families, distributed as follows: Three in Maine, 4 in New Hampshire, 2 in eastern Massachusetts, 3 in western Massachusetts, 2 in Connecticut, 8 in New York, under the control of the central ministry, 7 in Ohio and Kentucky (each State having 2 societies), and 1 in Florida, a branch of the community at New Lebanon, N. Y. The settlements at Oak Park, Ga., and Watervliet, O., have been abandoned through inability to clear the property of debt.

SHAPLEIGH, WALDRON, American chemist, died at West Lebanon, Me., August 30, 1901. He was born in Philadelphia, January 25, 1848, and graduated at Lehigh University in 1871. Afterward he studied chemistry at Paris and Vienna (1872-74), preceding this by four years as instructor in chemistry at Lehigh. In 1874 he was made superintendent of the Kings County Refining Company, a position he held until 1883, and in 1887 he became chemist to the Welsbach Light Company. He served in 1873 as the commissioner from Pennsylvania to the Vienna Exposition, and in 1893 he was one of the judges of awards at the World's Columbian Exposition in Chicago. Mr. Shapleigh was a member of the American Philosophical Society, a fellow of the London Chemical Society and the Society of Chemical Industry, and a member of the Historical Society of Pennsylvania.

SHAW, ALBERT DUANE, Congressman from New York, died at Washington, D. C., February 10, 1901. He was born at Lyme, N. Y., December 27, 1841, and served in the Civil War as private and non-commissioned officer in the Thirty-fifth New York Volunteers until 1863, being present at many important engagements. Thereafter, until the close of the war, he was a recruiting officer at

Watertown, N. Y. He graduated at St. Lawrence University, Canton, N. Y., in 1867, and in the following year was a member of the State assembly and colonel of the Thirty-sixth Regiment N. G., N. Y. From 1868 to 1878 he was United States consul at Toronto, and from then until 1886 at Manchester, England. Colonel Shaw was interested actively in the Grand Army of the Republic and was department commander, 1897-98, and commander-in-chief, 1899-1900. In February, 1900, he took his seat as a Republican member of Congress, having been elected to fill a vacancy.

SHEPARD, EDWARD MORSE, the candidate of the Tammany Democracy for mayor of New York City in the election of November 5, 1901, who was defeated by Seth Low (*q.v.*), was born in New York City in 1850. He was educated at the College of the City of New York, graduating in 1869, and studied law in the office of Man & Parsons, where he became managing clerk, and later (1890) one of the partners of the reorganized firm of Parsons, Shepard & Ogden. Besides gaining prominence for his efforts in behalf of municipal reform, Mr. Shepard is known as a leading corporation attorney in New York City, and as counsel for the Rapid Transit Commission he worked effectively for the adoption of the plans for the city's subway. He has published a life of *Martin Van Buren*, in the American Statesmen Series, besides many papers on economic subjects.

SHIP-BUILDING. Aside from the enormous increase in the tonnage for 1901 over the preceding year, which is discussed in some detail below, there is not much of interest to record in the field of marine engineering. A commercial application of the Parsons turbine was made in the *King Edward*, a fast passenger steamer completed to operate on the Clyde during the summer tourist season. This vessel achieved a speed of 20.48 knots over a measured mile during her trial trip with an indicated horse-power of 3,500. The machinery weighs 66 tons, or about one-half, per indicated horse-power, of the average weight of the machinery in ordinary vessels of the same type and size. In coal consumption the record of the *King Edward* was 25 per cent. less than that of the previous vessel in the same service. In addition to a new passenger vessel for the Clyde service, three yachts in which the turbine principle has been employed for the engines were under construction. Two of these are designed for a speed of 18 knots, one of which, a vessel of 1,700 tons, was being constructed for A. L. Barber, of New York. The third is designed to have 2,000 horse-power and run at a speed of 18 knots. The German naval officials have decided to supply turbine engines to a new torpedo boat, while Mr. Parsons has prepared plans for a 7,000-ton trans-Atlantic liner; but it seems as if the additional experience to be furnished by the steamers now in course of construction was needed before so large a venture would be attempted. Further tests on the use of oil as a fuel were made by British vessels, and the economy and efficiency were shown in the experiments. In the United States, aside from the progress of the great liners on the stocks at New London and the new vessels for the navy, interest was largely directed to the Great Lakes, where great increases to the ore-carrying fleet were made (see **IRON AND STEEL**), and numerous large vessels of the type adapted for this purpose were launched. These new vessels supplant the towed barges and smaller steamships formerly used, and are fitted with triple-expansion engines. The largest vessels constructed are 450 feet in length over all, 50 feet beam, and 28½ feet in depth, with a carrying capacity of 6,400 tons and costing between \$275,000 and \$300,000 each. These craft show a reaction from a tendency exhibited in previous years, when vessels of approximately 500 feet in length and 9,000 tons capacity were constructed. The orders taken for new ore-carrying vessels in 1901 to be completed during the following year were said to aggregate between \$9,000,000 and \$10,000,000.

The six largest merchant vessels launched during the year were the following:

Vessel.	Board of Trade Tons.	Builders of Vessel.
Celtic	20,904	Harland & Wolff, Belfast
Kronprinz Wilhelm	14,908	Vulcan Bldg. Co., Stettin
Minnetonka	13,545	Harland & Wolff, Belfast
Athenia	12,512	Harland & Wolff, Belfast
Walmer Castle	12,482	Harland & Wolff, Belfast
Noordam	12,480	Harland & Wolff, Belfast

As is seen from this table, Harland & Wolff launched five of the six, and they had also another vessel over 12,000 tons. The *Kronprinz Wilhelm* was the fastest steamship of the year, making 23.21 knots. The largest vessel of 1900 was the *Deutschland*, which was built by the Vulcan Company at Stettin. Were the list to include war vessels, there would be certain additions occasioned by warships of large displacement.

THE CELTIC—The Largest Steamship Ever Built.

Considering the world's ship-building for 1901, the number of vessels, the tonnage, and indicated horse-power for the year will be found in the following table:

WORLD'S SHIP-BUILDING FOR 1901 AND 1900.

	1901.			1900.		
	Vessels.	Tons.	I. H. P.	Vessels.	Tons.	I. H. P.
Scotland.....	376	554,406	472,190	406	534,769	490,646
England.....	834	1,091,347	896,328	816	994,519	679,380
Ireland.....	28	151,922	109,300	26	131,431	67,600
Foreign and colonial.....	1,233	1,797,675	1,476,818	1,248	1,660,709	1,237,626
	870	857,680	769,813	694	733,734	705,182
Total Great Britain.....	2,103	2,655,365	2,246,631	1,942	2,394,443	1,942,808
United States.....	128	279,097	292,822	87	179,838	144,437
Germany.....	241	265,860	237,760	247	252,533	268,406
France.....	32	85,971	42,638	40	73,310	59,445
Holland.....	132	53,789	12,725	186	38,497	4,990
Norway and Sweden.....	76	50,666	45,316	49	33,896	26,205
Italy.....	21	26,915	41,138	10	34,824	21,933
Denmark.....	20	20,935	21,815	13	14,479	11,340
Japan.....	49	20,763	27,856	41	23,784	27,856
Austria.....	24	20,162	30,280	8	21,776	20,200
Belgium.....	21	13,700	1,375	65	6,950	3,005
China.....	27	8,918	6,755	.....	.....	.....
Colonies.....	72	6,988	7,365	10	1,875	4,115
Russia.....	23	3,399	1,730	11	47,123	113,260
Spain.....	2	327	.....	7	4,840	.....
Greece.....	2	200	240	.....	.....	.....
Total for other countries.....	870	857,680	769,813	694	733,734	705,182
Total for the world.....	2,973	3,513,045	3,015,444	2,636	3,128,177	2,647,990

There was a great increase in tonnage launched from yards in the United States. In the accompanying table the number of sailing vessels and steamships, together with their tonnage, is given, and the output of each yard in 1901 and 1900, the totals showing an increase of 99,159 tons. The year has been one of prosperity to American ship-builders, and the industry is apparently being established on a firmer basis, which will be aided, so the builders say, by the passage of proper subsidy laws. An attempt was made during the year to organize a combination of ship-building interests,

UNITED STATES TONNAGE LAUNCHED 1901.

	SAIL.		STEAM.		TOTAL.	1900.
	Vessels.	Tons.	Vessels.	Tons.	Tons.	Tons.
American Co.....	...	.....	22	81,681	81,681	81,669
Newport News Co.....	...	.....	6	41,260	41,260	.....
W. Cramp & Sons.....	...	.....	6	31,866	31,866	34,498
Union Iron Works.....	...	.....	8	28,479	28,479	11,104
The Craig Co.....	...	.....	10	16,546	16,546	5,043
Harlan & Hollingsworth.....	...	.....	8	13,491	13,491	9,470
Delaware Co.....	...	.....	2	8,756	8,756	.....
Buffalo Co.....	...	.....	4	8,029	8,029	.....
The Jenks Co.....	...	.....	3	7,773	7,773	.....
Maryland Co.....	1	1,255	4	6,040	7,293	7,263
New York Co.....	...	.....	2	7,040	7,040	.....
A. Sewall & Co.....	2	6,662	...	.....	6,662	3,360
Neafie & Levy.....	...	.....	11	6,008	6,008	2,213
Bath Iron Works.....	...	.....	2	3,994	3,994	4,172
Hay & Wright.....	3	2,063	1	200	2,268	.....
J. W. Dickie.....	...	.....	6	2,000	2,000	.....
W. Boole & Son.....	2	1,367	...	.....	1,367	.....
W. R. Trigg Co.....	...	.....	2	1,295	1,295	.....
Johnston Works.....	...	.....	3	1,200	1,200	.....
Moran Bros.....	1	950	...	.....	950	2,420
Gas Engine Co.....	1	6	11	612	618	.....
G. Lawley & Son.....	...	.....	4	540	540	.....
Bell's Works.....	...	.....	1	120	120	.....
Atlantic Works.....	...	.....	1	43	43	452
Merrill-Stevens Co.....	...	.....	1	16	16	.....
Other firms.....	...	.....	...	.....	.....	18,188
Total.....	10	12,308	118	266,799	279,097	179,838

but was unsuccessful. Progress was made on the four large Pacific steamers under construction at New London, Conn., in the yards of the Eastern Ship-building Company, and a new and extensive plant is planned for erection on the Gulf coast. The output of the American Ship-building Company during the year amounted to 81,681 tons, an amount exceeded only by Harland & Wolff, Belfast, Ireland, with 92,316 tons, and by W. Gray & Co., of Hartlepool, England, with 82,262 tons. The American Ship-building Company owns yards at Detroit, Chicago, Cleveland, and West Superior, at which were built during 1901, 22 steamers having an aggregate tonnage of 81,681 tons and an indicated horse-power of 37,769.

The Bureau of Navigation reported that during the six months ended on December 31, 1901, there were constructed in the United States and officially numbered, 717 rigged vessels of 154,073 gross tons, compared with 568 rigged vessels of 179,229 gross tons for the corresponding six months of 1900, exclusive of canal-boats and unrigged barges. A decline of 19,752 tons occurred on the Atlantic seaboard, and is explained by the fact that the energies of large yards were being concentrated on several large ocean steamships to be completed in the first half of 1902. The six months' figures include 38 vessels, each over 1,000 tons, and aggregating 103,832 tons. Of these fourteen are steel steamships, aggregating 52,310 tons, built on the Great Lakes. Four for the seaboard are the two banana steamships *Watson* and *Buckman*, each of 1,820 tons, the *Hugoma*, 2,182 tons, and the *Minnetonka*, 5,270 tons. The *Minnetonka* will be cut in two to pass the canals. There were constructed on the seaboard 15 wooden schooners of 24,864 tons, five steel steamships for the coasting trade, and one steel ferryboat, aggregating 20,964 tons. The square-rigged vessels are the steel ship *William P. Frye*, 3,374 tons, and two barkentines on the Pacific, aggregating 2,310 tons.

The Bureau of Navigation Report for the fiscal year ending June 30, 1901, includes the following summary of vessels over 1,000 tons built in the United States and officially documented during that period:

	Seaboard.		Great Lakes.	
	Number.	Gross Tonnage.	Number.	Gross Tonnage.
Steel steamers	16	76,374	40	139,102
Steel steam dredges, etc.....	9	13,907	..	.....
Wooden steamers.....	2	3,284	2	3,268
Square-rigged vessels	6	11,257	..	.....
Wooden schooners	22	40,273	1	2,790
Rigged barges	10	13,077	4	8,446
Total	65	158,172	47	153,606

SHOOTING. In 1901 the annual contests of the National Rifle Association of America, held at Sea Girt, N. J., took on exceptional interest from the presence of two international teams, one from Ireland and one from Canada, an event which had not happened since 1877. In the 6 events America, for the first time, lost an international Match. The scores in the Irish-American contest were: 800 yds., Irish team 556, American 560; 900 yds., 549 and 515 respectively; 1,000 yds., 1,618 and 1,558. In the Canadian-American contest for the Palma trophy, the scores were: 800 yds., Canadians 532, Americans 525; 900 yds., 519 each; 1,000 yds., 1,522 and 1,494 respectively. The Hilton trophy was won by the District of Columbia from ten teams of 12 men each, making 1,098 on the three targets at 200, 500, and 600 yds. The Wimbledon cup, at 1,000 yds., was won by Captain William B. Martin, Second Regiment, N. J., with a score of 137. The Essex troop and Pennsylvania tied at 205 for the carbine team match at 200 and 500 yds., and Battery A, Light Artillery, Mass., won the revolver match, 10 shots, at 25, 50, and 75 yds., with a score of 596. These performances were nearly all below the average, and all the American marksmen showed lack of target practice. In trap-shooting an American team, which shot at the Middlesex Gun Club, England, June 11-13, 1901, more than redeemed the national reputation, shooting at clay birds, with single barrel; as against the English double barrel, the Americans scored 2,587 out of a possible 3,000, as against the English score of 2,344. In the annual championships of the United States Revolver Association at Sea Girt, N. J., Dr. R. H. Sayre, New York, won the military revolver competition with 325 out of a possible 375; Thomas Anderson, Boston, the pistol, with 453 out of a possible 500.

SIAM, an independent kingdom embracing part of the Indo-Chinese and part of the Malay peninsula. The capital is Bangkok.

Area and Population.—The boundaries have been changed so often that the exact area of the country is not definitely known, but it is estimated at about 200,000 square miles. According to the Anglo-French agreement of 1896, the integrity of all the territory in the basins of the Menam, Mekong, Pechaburi, and Bangpakong

rivers, and an extensive region to the north of the Menam, was assured to Siam. There is no census of the population, which is variously estimated at from 5,000,000 to 12,000,000, half of the latter figure probably being a conservative estimate. About 2,500,000 of the inhabitants are Siamese, and between 3,000,000 and 4,000,000 Malays and Chinese; the latter are increasing rapidly. Bangkok has about 250,000 inhabitants. Siamese is the official language of the kingdom and Buddhism the prevailing religion. The government supports both primary and high schools, and their efficiency and number is being increased continually.

Government and Finance.—The executive power is exercised by the king (Chulalongkorn I., who succeeded to the throne October 1, 1868), advised by a cabinet appointed by him and an appointed legislative council. There is a standing army of 5,000 men and a navy of 22 small vessels.

The principal sources of revenue are the taxes on imports, opium, spirits, and gambling. The revenue, according to the budget of 1900-01, was 36,760,000 ticals, or about £2,162,000. The tical is a silver coin worth 60 per cent. of a Mexican dollar, or 27.84 cents, on October 1, 1901. The estimates of revenue for the year 1901-02 were £2,130,000, and expenditure £2,284,457. In spite of this apparent deficit, the finances, which are under the control of an Englishman, who acts as comptroller-general, are in a healthy condition, and the import duties are increasing rapidly. The government is gradually abolishing its tax on lotteries and gambling establishments, which in 1900 furnished about one-fifth of the entire revenue. In some of the provinces such institutions have already been declared illegal. A new issue of government notes in denominations of 5, 10, 20, 100, and 1,000 ticals was begun in September, 1901, with the idea of unifying the monetary system and replacing the private bank notes already in circulation. There is no public debt, and in 1899 there was a cash balance in the treasury of 25,000,000 ticals, including a sum of £200,000 invested in British consols.

Industry and Commerce.—The principal products are teakwood, of which Siam produces one-fourth of the world's output, rice, sandalwood, rosewood, fruits, and garden products. The total imports amounted in 1899 to £2,532,137 and the exports to £3,123,775, the largest item in the latter being rice, which was valued at £2,223,953. The teak exported was valued at £323,867. Eighty-five per cent. of the foreign trade passed through the port of Bangkok. Industry is in a low state of development, owing to the condition of the inhabitants, who are still virtually serfs, although the government has recently adopted measures for the amelioration of their condition.

Communications.—Railway construction in the past few years has progressed rapidly. The first railway, from Bangkok to Paknam (14 miles), was opened in 1893. A road from Bangkok to Korat, 165 miles, was opened in November, 1900, forming the first section of a main trunk line, which it is proposed to build to the north. The branch road from Bangkok to Laphuri was opened in January, 1901, and a third section, about 100 miles in length, running west to Ratburi, and thence south down the peninsula, is being constructed.

History.—Negotiations with France over the unsettled boundary between Siam and French Indo-China were in progress during the latter part of 1901 in Bangkok. Siam was willing to make substantial sacrifices to obtain a final settlement, but two former attempts at settlement since 1893 have come to naught. The British view, as expressed in the *London Spectator*, is that France has no intention of giving up any of her demands, but is determined to build up an Indian empire at the expense of Siam. The principal points in dispute are the limitation of French and Siamese territory of Luang Prabang, the restoration of Siam's civil jurisdiction in the neutral zone along the Mekong River, the French occupation of Chentabun, and the grant of commercial privileges to France in the valley of the Mekong. The chief obstacle to a satisfactory settlement seems to be the difference as to Chentabun, the evacuation of which by the French is insisted upon by Siam. The British look upon the steady encroachment of France upon Siamese territory with alarm, considering it of the utmost importance that Siam be preserved in its integrity to act as a buffer state between Indo-China and British Burma.

SIBERIA, a part of Asiatic Russia, has an estimated area of 4,833,496 square miles. The population, which, according to the census of 1897, was 5,727,090, has probably increased to about 7,000,000, largely by reason of recent heavy immigration and the development of railroads and mines in the last few years. The largest cities are Tomsk, Irkutsk, Blagovestchensk, and Vladivostok. This city, which is the terminal port of the Trans-Siberian Railway system, has assumed international importance. According to the census of 1897 it had 28,896 inhabitants, a number that is possibly doubled at the present time. It is to be made a Russian naval station. Of the population of Siberia, 4,950,000 are Slavic; the remainder is composed of Tartars, Armenians, Lithuanians, and other Asiatic races. The immigration from Russia, which has averaged 250,000 a year, was over 200,000 for the first six months of 1901 alone.

Products and Industries.—An incomplete report for 1899 showed the area under cultivation to be 8,740,000 acres. The production of the principal crops for 1901 was: Wheat, 16,503,512 bushels; rye, 15,620,106 bushels; oats, 21,568,886 bushels; barley, 2,002,601 bushels; buckwheat, 500,537 bushels; potatoes, 13,157,790 bushels. Siberia has a vast area of forest land, about 337,500,000 acres having been explored, of which about 94,500,000 acres are considered worth working. Lumbering is carried on along the valley of the Yenisei, whose estuaries are clear of ice for a short period. The mining industry of Siberia is as yet in a primitive stage. The gold yield for 1898 was 28,845 kilogrammes. Valuable gold fields have been discovered in Yeniseisk, and in the basins of the Obi, Lena, and Amur rivers. About 50,000 men are employed in this industry. The total gold-bearing area is estimated at 880,000 square miles, as compared with 265,000 in the United States. Mr. C. W. Purington, an American mining expert, who made an examination of Siberia's mineral resources in 1901, estimated that with the introduction of modern mining machinery and methods, the annual gold output of the country could be raised to \$200,000,000, and maintained at that figure for a period of at least 30 years. Silver, copper, iron, and zinc are found, but modern mining methods and machinery have not yet been introduced to any considerable extent. Coal is mined in eastern Siberia, chiefly on the island of Sakhalin, and mostly by convict labor. A layer of coal has recently been opened 20 miles from Vladivostok estimated to be capable of yielding 40,000,000 tons. Coal has been found at about 50 places along the line of the Trans-Siberian Railway, and there are abundant signs of lignite throughout eastern Siberia that will soon be subjected to mining operations to supply railway needs. According to the census of 1897 there were in Siberia 4,870 industrial establishments, not including the flour mills, employing 26,290 persons. The value of the annual output was about 20,000,000 rubles (ruble=51.5 cents). Fishing and the hunting of fur-bearing animals are important industries.

Commerce.—The trade of Siberia with European Russia has been greatly stimulated by the opening of the Trans-Siberian Railway. The total commerce, however, is still inconsiderable. No trade statistics exist, the commerce being included in that of Russia.

As to the recent general development of Siberia, Mr. Archibald Colquhoun, an English authority, says: "Irkutsk, now within less than eight days of Moscow (two years ago the journey took ten and a half days), and three and a half from Sryetensk, the navigation limit of the Amur, and close to the junction for the Manchurian railways, is one of the richest cities in all Russia. It contains splendid buildings, fine churches, a big theatre, colleges and schools, and the nucleus of an excellent museum. As one traverses westward from this city, the succession of villages is almost unbroken, until from Krasnoyarsk onward to the Ural Mountains one hardly ever loses sight of distant towns or villages sprung up round the wayside stations. Tomsk and Omsk, both situated on large rivers, have increased in size and importance—everywhere, indeed, there are visible signs of growth; and though much more might be done, especially in the way of agriculture, it cannot be denied that the trans-Siberian has fully justified its originators in opening up the country." See RUSSIA (paragraph Communications).

SIEMENS, Dr. GEORG VON, German banker, died in Berlin, October 24, 1901. He was born at Torgau, Germany, October 21, 1839, and studied law at the universities of Heidelberg and Berlin. In 1870 he became a director of the Deutsche Bank of Berlin, and devoted himself to its interests until a short time before his death. Through its foreign connections, the Deutsche Bank, during his term as director, became one of the strongest in Germany, and the advice of Dr. von Siemens was frequently sought by the government. He served in the *Reichstag* from 1874 to 1877, from 1884 to 1893, and from 1898 until his death, as a Moderate Radical. Dr. von Siemens was among the best-known of the modern German financiers, and he had a large share in winning for his country the high place in the commercial world which she now occupies.

SIENNA. See MINERAL PAINTS.

SIERRA LEONE, a British crown colony on the west coast of Africa, between Liberia and French Guinea, has an area of about 4,000 square miles, and a population estimated at 136,000, of whom less than 300 are whites. Since 1896 there has been attached to it for administrative purposes an inland region known as the Sierra Leone Protectorate, with an estimated area of 30,000 square miles and an estimated population of 1,000,000. Freeport, the chief town (population about 30,000), has one of the best harbors on the African coast. The colony is administered by a governor (Sir Charles Anthony King-Harman), assisted by executive and legislative councils; he controls the protectorate through appointed commissioners for each of its five districts. The revenue in 1900 was £168,668, the largest on record, showing an increase from £89,869 in 1890. The expenditure for 1900 was £156,421. There

is no public debt. Customs duties are the main source of revenue, amounting in 1900 to £102,969. Imports in 1900 were valued at £558,271 and exports at £362,741, a very considerable decrease in the former and an increase in the latter. The colony itself produces scarcely anything, and the exports, consisting chiefly of palm-kernels, cacao, and cola nuts, ginger, rubber, hides, and beeswax, are brought mainly from the hinterland. The railway now under construction will considerably develop the colony and open up the interior. The first section, 32 miles in length, was opened in May, 1899; a second, 23 miles long, was completed in 1900; and a third section of 25 miles was under construction in 1901.

SILK INDUSTRY. Conditions in the silk industry during 1901 differed greatly from those recorded for the previous year. The United States again occupied the place gained in 1899 of being the largest consumer of raw silk of any country of the world, and the imports for 1901 not only were greater than for 1900 by a substantial amount, but were the largest ever recorded. According to the Silk Association of America, the world's production of raw silk in the past four years, and the present silk season, July 1, 1901, to June 30, 1902 (estimated), was as follows:

Silk Season.	Kilogrammes.	Pounds.	Silk Season.	Kilogrammes.	Pounds.
1897-98.....	14,123,000	31,135,565	1900-01.....	16,223,930	35,767,276
1898-99.....	14,430,000	31,812,378	1901-02 (est.)....	15,870,525	34,988,159
1899-1900.....	16,767,000	36,964,528			

Of the total production, the amount consumed in the United States was somewhat over one-third, and was obtained largely from Japan, which sent the largest amount ever shipped to this country in any one year, and practically double the amount shipped in 1900. The full figures for United States imports of raw silk for 1900 and 1901 are given below:

Year Ended Dec. 31.	1900.			Year Ended Dec. 31.	1901.*		
	Bales.	Pounds.	Value.		Bales.	Pounds.	Value.
Strictly European.....	11,011	2,454,200	\$11,092,863	Strictly European...	12,267	2,680,740	\$10,166,584
Asiatic reshipped by Europe.....	227	27,308	79,777	Asiatic reshipped by Europe.....	146	16,874	38,107
Europe.....	227	27,303	79,777	Japan.....	47,662	6,630,122	21,496,925
Japan.....	24,443	8,339,611	13,400,208	Canton.....	6,436	693,964	1,740,696
Canton.....	7,534	808,816	3,093,869	Shanghai.....	14,489	1,951,913	6,155,210
Shanghai.....	11,624	1,564,391	6,021,315				
Totals.....	54,739	8,179,321	\$33,628,022	Totals.....	81,000	11,873,613	\$39,597,422

* Arrivals at San Francisco since December 20, 1901, are estimated.

Shanghai and Canton ship the larger part of their raw silk to Europe, but Japan sends almost twice as much to the United States as to Europe. Japanese raw silk at the close of the year commanded a price of from \$3.75 to \$3.90 a pound, there being an increase in price of about 30 cents a pound since the crop of 1901 was put on the market, July 1. The manufacturers were remarkably active during 1901, and at the close of the year every available silk spindle was said to be in operation. Not only was the over-production of the previous year successfully marketed, but there was a constant and growing demand for new goods. The silk industry during the year shared the general prosperity characterizing American manufacturing; but in France labor difficulties and in Germany general depression tended to restrict the demand for a product which nearly always must be considered in the light of a luxury. A rapid development of the silk industry has taken place in the last two decades, and at present nearly all the standard grades of silk used in the United States are of domestic manufactures, the imports being mainly of novel patterns or fabrics made on hand looms, or velvets or laces. In 1882 there were 395 silk factories in the United States, as compared with about 900 in 1901. At the former date there were engaged in broad-silk weaving 5,500 power looms and 3,100 hand looms, while on June 30, 1901, there were 45,000 power looms and but 800 hand looms, showing how the introduction of improved machinery has changed the conditions of manufacture. In the same interval the increase in looms devoted to ribbon weaving has been from 2,500 to 7,000, while the number of spindles in the entire industry has grown from 450,000 to 1,900,000. In 1901 it was proposed by Secretary Wilson, of the Department of Agriculture, to introduce silk culture on a large scale. It may be noted that attempts at sericulture have been made in certain States, but without success.

SILL, JOHN MAHELM BERRY, formerly minister to Corea, died at Detroit, Mich., April 6, 1901. He was born at Black Rock, N. Y., November 23, 1831, and was the first graduate of the Michigan State Normal School (1854). He was principal of that school from 1886 to 1894. For a time he was superintendent of schools in Detroit, and from 1867 to 1870 was a member of the board of regents of the University of Michigan. From 1894 to 1897 he served as United States minister to Corea. He was the author of *Synthesis of the English Sentence* (1856) and *Lessons in English* (1879).

SILLIMAN, BENJAMIN DOUGLAS, lawyer, died in New York City, January 24, 1901. He was born at Newport, R. I., September 14, 1805, and graduated at Yale University in 1824. After graduation he studied law at New York, in the office of Chancellor Kent, and was admitted to the bar in 1829. For one term (1838-40) he was an assemblyman. He was a delegate to the national Whig convention of 1840 and the Republican convention of 1876, and an active member of the New York constitutional convention of 1872; but his candidacy for other State and national offices was unsuccessful. Mr. Silliman attained to a very extensive practice, and in his long service was engaged in many noteworthy legal contests. He was also counsel for a number of corporations and an officer in various societies. For a number of years he had been known as the oldest living graduate of Yale and the oldest member of the New York bar.

SILVER. The production of silver in the United States in 1900 amounted to 57,647,000 fine ounces, having a commercial value of \$35,741,100. This is an increase of 2,882,500 fine ounces over 1899. It was expected that the production of 1901 would reach 59,500,000 ounces. During the latter year there was a decrease in the production of the lead-silver ores, but an increase in the yield of argentiferous iron and copper ores. The Leadville (Col.) district has shown a wonderful increase; but there has been a great falling off in the quantity of silver smelted and refined in the United States from foreign mattes. This falling off is due chiefly to smaller shipments from British Columbia and Mexico. It is thought that the world's production in 1901 will prove to be less than in 1900. This decrease is partly due to a falling off on the part of some of the famous Bolivian silver mines; although those of some other South American countries, such as Chile and Peru, showed an increase.

APPROXIMATE DISTRIBUTION, BY PRODUCING STATES AND TERRITORIES, OF THE
SILVER PRODUCT OF THE UNITED STATES FOR THE CALENDAR YEAR 1900
AS TO SOURCES OF PRODUCTION.

(As reported by Officers and Agents of the Mint.)

STATE OR TERRITORY.	SILVER.			STATE OR TERRITORY.	SILVER.		
	Quartz.	Lead ores.	Copper ores.		Quartz.	Lead ores.	Copper ores.
	Fine ozs.	Fine ozs.	Fine ozs.		Fine ozs.	Fine ozs.	Fine ozs.
Alabama.....	160			North Carolina.....	12,364		
Alaska.....	74,818			Oregon.....	79,668	52,374	
Arizona.....	2,571,977	225,732	1,452,291	South Carolina.....	391		
California.....	614,412	54,713	499,032	South Dakota.....	558,903		
Colorado.....	4,802,856	16,079,127		Tennessee.....	1		
Georgia.....	489			Texas.....	477,400		
Idaho.....	1,021,153	5,528,965		Utah.....	2,027,038	5,912,184	1,442,467
Maryland.....	2			Virginia.....	96		
Michigan.....			102,042	Washington.....	154,270	146,300	2,000
Montana.....	2,835,948	2,134,802	9,324,085	Wyoming.....	256		
Nevada.....	1,125,000	868,566		Total.....	16,496,711	30,592,763	13,121,912
New Mexico.....	139,619	90,000	300,000				

a Lead and copper ores.

SILVESTRE. PAUL ARMAND, French author and art critic, died at Toulouse, February 19, 1901. He was born in Paris, April 18, 1837, and, with the intention of following a military career, entered the Ecole Polytechnique in 1857, but did not take a commission when he graduated two years later. He entered the ministry of finance in 1860 as inspector, and afterward became a director of the archives. He received the cross of the Legion of Honor in 1886, and in 1892 was appointed inspector of fine arts. M. Silvestre was an indefatigable writer, and produced prose and verse with equal facility. Some of his works are: *Rimes nouvelles et vieilles*, with a preface by George Sand (1886); *Grisélidis*, a drama in verse (1891); and *Izéyl*, a tragedy in verse, presented by Mme. Bernhardt (1893). He contributed regularly to *Gil Blas* and the *Journal*, of Paris, between 1881 and 1895, his work during this time being afterward published in thirty volumes; and, beginning with 1888, he published an annual volume, *Le Nu au Salon*, containing his art

criticisms. He also wrote libretti for music by Gounod, Saint-Saëns, and others. He was a master of form and imagery, and in his weightier works displayed much depth and seriousness. In his shorter poems it is his erotic fervor which is the chief characteristic.

SIMPLON TUNNEL. See TUNNELS.

SKATING. The United States figure skating amateur championship held at the St. Nicholas rink, New York, in March, 1901, was won for the fourth consecutive time by Dr. A. G. Keane, of the New York Athletic Club, against four competitors. The speed skating championships of the United States were held at Montreal, Canada. The results were as follows: 220 yards, won by Fred. J. Robson, Royal Canadian B. C., Toronto—time, 20 2-5s.; 1 mile, won by C. Bellefeuille, Rat Portage—time, 2m. 53 3-5s.; 880 yards, won by James Drury, Montreal—time, 1m. 27 2-5s.; 3 miles, won by Z. P. St. Marie, Montreal—time, 9m. 12s.; 5 miles, won by E. A. Thomas, New York A. C.—time, 16m. 56 2-5s. Le Roy See skated one-half mile in 1m. 25 1-5s., and one mile in 2m. 56 4-5s., in the Pittsburg (Pa.) rink, February 14, 15, 1901. The championships of the world in speed and figure skating were contested for at Stockholm, Sweden, February 9 and 10, 1901, over 500, 1,500, 5,000, and 10,000 metres. Frans Fred Wathen, of Helsingfors, won three of the four distances, and thereby the world's championship for speed skating; viz., 500 metres in 54 seconds, 1,500 metres in 2m. 43 3-5s., and the 10,000 metres in 20m. 13 1-5s. He lost in the 5,000 metres to Rud Gunderson, in 9m. 56 4-5s. The figure-skating championship was won by Oscar Holthe, of Trondhjem. Owing to the death of Queen Victoria, the English were merged in the Stockholm contests. The one-mile speeding skating championship of Scotland was won by J. Bayne.

SMALLPOX AND VACCINATION. In spite of untiring effort and undiminished ardor, bacteriologists have failed to isolate the bacterium or the protozoon that causes smallpox. The search has been prosecuted since 1863, when Beale found in vaccine lymph granules which were considered specific, confirming the observations of Sacco in 1809. But a multitude of tests and experiments results in the abandonment of nearly all the claims of the investigators, in most cases by themselves as well as by others; and the fact remains that the specific germ of smallpox is still awaiting discovery. Funck, of Germany, however, in a preliminary paper published in February, 1901, stated positively that the protozoa of Guarniere and Pfeiffer are the cause of vaccinia. His complete report is awaited with interest. It is probable that the disease is air-borne. Disinfection of dirty nooks and corners, and fumigation of clothing, rooms, and public conveyances used by smallpox patients lessens the likelihood of the spread of the disease. Contact with convalescents is dangerous till the last scab has separated and the skin is clear and the patient has been disinfected. But the true method of control of the disease is by vaccination and revaccination.

Smallpox in the United States.—Smallpox is a winter disease, because of the limitation of ventilation by closure of doors and windows; less frequent bathing, washing of clothing, and scrubbing of floors during cold weather; and the closer contact of people living in tenements, in order to economize fuel by warming fewer rooms. The conditions mentioned favor the spread of infection. During the fall and winter of 1900-01 there were 12,000 cases of the disease reported, against about 7,000 during the same period of the previous year. Fortunately, the death-rate was very low, amounting to little more than 1 per cent. The usual mortality from the disease is 50 per cent. in the unvaccinated and 2.3 per cent. in those once vaccinated but neglecting frequent revaccination. During the term mentioned Colorado reported 1,190 cases; Minnesota, 1,085; Wisconsin, 560; Virginia, 257; Tennessee, 308; Oklahoma Territory, 690; New York, 416, with 67 deaths; Pennsylvania, 102, with 3 deaths. In Louisiana the disease was more fatal, for of its 157 cases there were 37 that died, showing a mortality of 23 per cent. Early in January, 1901, a considerable outbreak of smallpox in Galveston, Tex., was noted. In February, Virginia reported an invasion of the disease, and all the large cities in the country were admitting its presence. In May, New Jersey towns became infected, and the disease appeared among persons on the United States transport *Indiana*, which was bearing troops from Peking to Manila. In June, an epidemic of the scourge was reported existing in Alaska, among Indians principally, but also in mining towns; and New England States also returned statistics of a few cases. In August, Philadelphia began to suffer from an epidemic that lasted all the rest of the year. In November, many more new cases entered the isolation hospital of that city, the record for 1901 up to November 9 being 559 cases, with 78 deaths; while during the last week in the month 116 new cases were reported. Wisconsin suffered, also, in November, from an exacerbation of her epidemic, several hundred cases existing in Calumet county alone. For further statistics of the disease in the United States, as well as in foreign countries, see VITAL STATISTICS.

Vaccination.—Vaccinia, or cowpox, the disease produced by vaccination, is a modified form of smallpox. Vaccine is lymph taken from a vesicle of a calf that has been inoculated with smallpox. The disease is altered by passing through the animal, and inoculation of the human being with vaccine transmits a very mild and non-contagious form of the disease, which causes such an alteration in the blood of the vaccinated person that he is immune to smallpox for a time. Probably an antitoxin is developed which safeguards him. Some persons are rendered immune for life by one vaccination; some are protected for only one year; while in general the effect of a true vaccination lasts three or four years. Travelers, therefore, or persons in large cities or seaport towns, should be revaccinated once in three or four years. At the outbreak of an epidemic, all persons should be revaccinated, regardless of the date of a previous vaccination. Infants should be vaccinated at birth, if born in an isolation hospital; at the age of a few days, if born during an epidemic; otherwise, at the age of three months. Opposition to vaccination is absurd and irrational, as an examination of the facts in the case will show. In 1803, the sovereign of Prussia stated that 8,000 persons had been inoculated with smallpox after successful vaccination, and not one had contracted the disease. The average death-rate from smallpox in Prussia at that time was 40,000 people a year. In 1874 a vaccination law went into effect in Prussia, under whose provisions every child under 2 years of age was vaccinated, and revaccination at 12 years was made compulsory. Between 1866 and 1874 the deaths from smallpox per million of population varied from 175 to 2,624 each year. From 1874 to 1885 the deaths from smallpox in Prussia ranged from 36 to 3 per million inhabitants; between 1886 and 1898, from 5 to 0.2 per million. From November, 1900, to April, 1901, in the city of Chicago, there were 171 cases of smallpox reported. Of this number, 140 cases were in persons who had never been vaccinated; 29 were in adults who claimed to have been vaccinated, and had imperfect scars, if any; and only 2 cases were in persons who presented marks of successful vaccination. Of these 2 cases, one was in a person 40 years old, who had not been vaccinated since childhood; the other in a person 35 years old, who had been vaccinated in childhood and also unsuccessfully three years before his attack. Previous to the occupation by the United States government and the employment of universal vaccination, the mortality from smallpox in Porto Rico was 600 a year. It is now 2 a year. In countries where vaccination is compulsory or methodical, smallpox is no longer the prevalent and mortal scourge it was before restriction; and even when epidemics occur in such countries the death-rate is small, owing to partial control by even a single vaccination in infancy. See TETANUS and VITAL STATISTICS.

SMITH, Sir FRANK, Canadian senator, died at Toronto, January 17, 1901. He was born at Richhill, County Armagh, Ireland, in 1822, and was taken by his father to Canada at the age of ten. At first employed on a farm, he afterward became a merchant, amassed a fortune, and retired from active business life in 1891, although retaining offices in numerous companies. In 1882 he became a privy councillor, and was knighted in 1894. A Conservative in politics, he was a member successively of the Macdonald, Abbott, Thompson, Bowell, and Tupper ministries.

SMITH, GEORGE MURRAY, English publisher, died in London, April 6, 1901. He was born in London, March 19, 1824, and received his training in the India house of Smith, Elder and Company, of which his father was chief partner. At nineteen he was put in charge of the firm's hitherto unimportant publishing department, and soon advanced it to the first rank. At twenty-one, upon the death of his father, he assumed complete control of the firm, and soon afterward established relations with some of the famous English authors of the time. The works of Darwin and Ruskin were among his first ventures, and in 1851 he became Thackeray's publisher, putting out in that year *Henry Esmond*. From that time the most cordial relations existed between Thackeray and Mr. Smith, and it was with the idea of giving Thackeray's work the widest circulation that the firm founded the *Cornhill Magazine* in 1859. In 1865 Mr. Smith established the *Pall Mall Gazette*, to be written "by gentlemen for gentlemen," to which some of the early contributors were Matthew Arnold, Leslie Stephen, and Sir James Fitzjames Stephen. With George Eliot, Matthew Arnold, and Robert Browning, Mr. Smith had close relations, both as publisher and intimate friend. It was as publisher of the great 63-volume *Dictionary of National Biography* that Mr. Smith's name will be longest remembered. In 1882 he conceived the plan of gathering a complete record of the achievements of the men and women of British and Irish nationality; and under the editorship of Leslie Stephen, and latterly of Sidney Lee, it was brought to a successful end in 1900.

SMITH, JAMES ARGYLE, Confederate brigadier-general, died at Jackson, Miss., December 6, 1901. He was born in Mississippi in 1831, and graduated at West

Point in 1853. Appointed a second lieutenant in the Sixth United States Infantry upon graduation, he served on the western frontier and the Pacific Coast until 1861, when he left the service to enter the Confederate army as first lieutenant. He served through several campaigns, and was promoted rapidly, until in 1863 he was made a brigadier-general. In 1878 he was elected State superintendent of education of Mississippi, and was reelected in 1882. From 1893 to 1897 he was in the United States Indian service.

SMITH COLLEGE, Northampton, Mass., was founded in 1871, for the higher education of women. During the year 1900-01 the faculty consisted of 83 professors and instructors, and the student-body of 1,048, distributed as follows: Undergraduates, 1,022; graduates, 6; school of music, 9; art, 11. The college is not intended to fit women for a particular profession, but to give a broad, liberal education. It is unsectarian in its management and instruction. After the year 1904, only the degree of Bachelor of Arts will be conferred for undergraduate work; but till then the degrees of Bachelor of Letters and Bachelor of Science will be conferred as heretofore. There are 32 scholarships.

SMOKE PREVENTION. The policy adopted by the city of Cleveland in 1900 for abating the smoke nuisance has been followed more or less fully by other American cities, notably St. Paul, Indianapolis, and Kansas City. Authorized by State legislation, a supervising engineer was appointed in Cleveland in July, 1900, who has the whole matter of smoke suppression in charge. A list of all the steam-boiler plants in the city was made and a campaign of inspection and education entered upon. For the information of all those who were about to put in boiler plants or remodel their furnaces, a file of catalogues, blue prints, and specifications of the principal stokers and smokeless furnaces in use, were collected. In his first published report, made a few months after his entrance into office, the supervising engineer reported that 80 smokeless furnaces had been introduced since his appointment. Fines are levied only as a last resort after instruction and persuasion have failed to produce results. Photographs of their chimneys, with black smoke belching forth, prove the most conclusive argument of the need of reform that can be presented to manufacturers. In Baltimore, where the campaign has been conducted by the Municipal Art Society, much opposition has been made by the manufacturers on account of the alleged increased cost of power when any device for the suppression of smoke is enforced. In the chapter on "Suppression and Repression," in his book on *The Improvement of Towns and Cities* (New York, 1901) C. M. Robinson discusses the smoke problem and suggests that the opposition that is encountered to reform arises from a conviction that smoke represents industry and that people will stand any amount of smoke if it comes from chimneys of buildings where men and women are earning good wages. "And yet," concludes Mr. Robinson, "the evil of dense smoke, its injury not only to the exteriors of all buildings in the city, and to the vegetation in park and garden; but the harm which it does to health, clothing, books, pictures, furniture, all household decorations, and exhibited wares, seems so obvious, that one would think no other instruction than that of the senses necessary. If the extra expense imposed on a community by its smoke could be accurately measured, it is not unlikely that the aggregate, to which every member would contribute something, would far exceed the saving that is made by submission to the nuisance." M. N. Baker, in his recently published *Municipal Engineering and Sanitation*, includes a brief chapter on smoke abatement, in which the various methods that have been tried or proposed for suppressing the smoke nuisance, are discussed. He groups these methods in three classes: (1) The use of only those fuels which do not produce smoke, such as anthracite coal, coke, and petroleum; (2) consumption of the smoke; and (3) the use of some process which shall insure smokeless combustion of the great smoke producer—bituminous coal. Mr. Baker considers the last line of work the most hopeful, his conclusions being based on the reports of different experts who have given the subject special consideration. That soft coal may be so used as to produce little smoke has been demonstrated. To accomplish smokeless combustion, there must be: (1) Sufficient supply of air to furnish the necessary oxygen; (2) uniform high temperature of air and gases within the furnace; (3) uniform supply of fuel. These three essentials are effected by having a wider grate surface than in the ordinary furnace; by lifting the boilers farther from the fire, so their surface may not precipitate the carbon into flakes, by arresting its decomposition; and by the use of artificial stokers to avoid the inrush of cold air which occurs when the furnace door is opened.

SNOW, LORENZO, president of the Mormon Church, died at Salt Lake City, Utah, October 10, 1901. He was born at Mantua, Ohio, April 3, 1814, and studied for a time at Oberlin College. Leaving there in 1836, he made the acquaintance of Joseph Smith, and was converted to Mormonism. After being baptized and made an elder in the church, Mr. Snow entered the missionary field, traveling over 150,000 miles

in the United States and England. In 1840 he went to England, returning a year later with 250 converts on a specially chartered ship. From 1852 to 1882 he served continuously in the Utah legislature, in 1885 he founded the town of Brigham, Utah, and at various times he made journeys into all parts of the world in the interests of Mormonism. In 1889 he was chosen president of the Twelve Apostles, which put him in line for the presidency of the church, to which position he was chosen in 1898. He wrote a number of books on Mormonism.

SOAPSTONE. See TALC AND SOAPSTONE.

SOCIALISM. The International Socialist Committee provided for at the Paris Conference of 1900, held its first meeting at Brussels, December 30, 1901. There were present Hyndman and Quelch, from England; Vaillant and Gerault Richard (who also represented Argentina), from France; Singer and Kautsky, from Germany; Von Kol and Troelstra, from Holland; Cesarine Wojnarowski, from Poland; Anseele and Vandervelde, from Belgium; George S. Herron, from the United States; and the Russian Socialists, Plekhanoff and Krichewski. The first business of the committee was the ratification of the constitution. It was announced that 22 nationalities had given in adhesion to the international congress, including Japan, Servia, Bulgaria, and Australia. During 1901 the committee published the following manifestoes: (1) Concerning troubles in Russia; (2) on the atrocities in Armenia; (3) on concentration camps. As a result in some countries the last subject has been brought before the legislatures, and public demonstrations have also been made. The international bulletins, some 27 in number, have thus far appeared in the *Peuple* of Brussels. The establishment of an independent international bulletin was discussed; but for the present it was decided to publish the bulletins as parts of existing national journals. Special pamphlets will also be published containing lists of labor organizations and other matters of interest. It was emphasized that the object of the committee was to collect information, not to lead the movement. The committee has already been consulted on questions of interest to workmen. The codification of the resolutions of the Paris congress, and the preparation of a volume on the history of socialism in the nineteenth century were announced. Preparations were also made for the International Socialist Congress to be held in Amsterdam in August, 1902. The following resolutions were passed: (1) A protest against the "Germanization" policy pursued by the Prussian government in Poland, which was characterized as a barbarous method to compel the Poles to abandon their mother tongue. (See GERMANY, paragraph The Polish Question.) (2) A resolution against the imperialistic policy adopted by all governments, the object of which, the Socialists claim, is to carry out the economic schemes of the capitalistic class, which follows the same ruthless methods in every country, whether it be the English in South Africa, the Americans in the Philippines, or all civilized countries in China. India is cited as an example of the effect of capitalistic exploitation. Competitive capital is using this policy to cover its own weakness and to protect itself from the increasing strength of socialism. The resolution calls upon all workmen to band together against this "last and worst form of class domination." (3) A resolution condemning the odious Russian despotism which brought about the massacre of May 7, and the trouble in the Obukhoff works at St. Petersburg. The committee expressed sympathy for the Russians in their fight against "Czarism"—"the common enemy of socialism and democracy." (4) Another resolution protesting against the destruction of the constitution of Finland (*q.v.*) by the Russian government; and the prohibition which closes the middle and higher schools to Jews. The resolution states that the Jewish Socialist workers in Russia deserve well of the international proletariat. The committee adjourned to meet in July, 1902, in Brussels. A large public meeting was held, at which the members of the committee spoke, and a resolution was carried, stating: "The international meeting, assembled in the Maison du Peuple, declares that the industrial crisis which at present exists in all countries of Europe is the fatal consequence of the economic anarchy which characterizes capitalistic production. It expresses the conviction that the innumerable evils which result for the proletariat from this economic anarchy can be ended only by the socialization of the means of production and the triumph of international socialism."

The Situation in 1901.—According to the latest estimates the strength of the Socialists in the principal countries is as follows: The United States, 150,000; Belgium, 500,000, 32 deputies and 4 senators; Germany, 2,700,000, and 96 deputies; France, 1,500,000, 42 deputies, and 1 minister (Millerand); Italy, 170,000, and 32 deputies; Denmark, 43,000, and 14 deputies; Austria, 100,000, and 11 deputies; Netherlands, 17,000, and 7 deputies; England, 63,000, and 1 deputy; Spain, 50,000; and Switzerland, 100,000, a total of 5,393,000 votes. Socialistic agitation is also in progress in Canada, South America, Australia, Africa, and Japan. The greatest progress during the year was undoubtedly made among the Latin nations of Europe, and of these, the Socialist agitation was most prominent in Italy, where unhappy

economic and political conditions united to favor the radical propaganda. The Socialist deputies in parliament led the fight for the reduction of taxes on grains; in Naples they brought about the overthrow of the Camorra; and at Suzzera they could point to a municipality entirely under Socialist control, where industrial development has taken place, the level of education has been raised, and industrial schools have been established. Meals are served in the public schools, elections are orderly, and tickets for some theatre performances are distributed free. The most persistent opposition to the Socialists in Italy comes from the church. On January 26 the Pope issued a labor encyclical defining his position in regard to Socialism. He referred to his previous encyclicals which had resulted in Catholics devoting all their activities to social works in order to help the working classes, and he reviewed the different methods—labor bureaus, benefit funds, and workmen's associations—by which this is being done. He desired to set right the divergence of opinion regarding the names—Christian Socialists and Christian Democrats. Christian Socialism is objectionable because socialism concerns itself solely with material possessions, always seeking to establish perfect equality and a common holding of goods. Christian Democracy, on the other hand, respects the principles of divine law and while seeking material amelioration has in view the spiritual welfare of the people. However, Christian Democracy must not be confounded with political Democracy. Christian Democracy can and ought to subsist, as the church itself, under most varied political régimes. It ought, moreover, to respect laws of legitimate civil authority. The Pope commends the zeal of Catholics, who engage in ameliorative work, eulogizes the giving of alms—so distasteful to Socialists—says that Catholics should act together to preserve a community of effort and sentiment, and urges people, especially workmen, to inculcate correct principles and shun everything of a seditious or revolutionary character.

In general the tendency on the part of the Socialist party to abandon its revolutionary character and enter upon a policy of compromise was accentuated in 1901. As was pointed out by Professor E. Untermann, in the September number of the *International Socialist Review*, the Socialist propaganda must necessarily advance in proportion with the spread of capitalism and the disappearance of the small trader and the middle class as a whole. Now, though this development has certainly taken place in the United States, it has not progressed with anything like the same haste in the countries of Continental Europe, where the general control of the railways, and, in a lesser degree, the mines and other sources of public wealth by the government, has prevented the accumulation of enormous fortunes. As a consequence, the idea of a class struggle has gradually fallen into the background and European Socialists have entered upon a policy of compromise, or as it is called in France, opportunism, which in many cases has resulted in estranging from the party councils the radical elements which still cling to the economic revolution as the only means of establishing the Socialist system. In many countries of Europe, therefore, the activity of the Socialists has been directed towards the aims, which, in the United States and Great Britain, have been attained through trade-unionism or by reform legislation. Thus, as has been noticed, in Italy the Socialists have devoted their attention to the establishment of agricultural labor unions and the agitation for financial reform. In France and Germany the Socialists have already obtained full control of the labor unions. In Belgium, they are mainly occupied with the propaganda for universal suffrage, and have gained over a large proportion of the army, the militia, and the police. In Switzerland, where general prosperity prevails, they are inactive, and the same is true, though in a less degree, of Holland and Scandinavia. Many Socialists are not yet ready to recognize the transformation which the aims of the party are undergoing. At a convention of the Socialist Democratic party of Germany, which assembled at Lubeck in 1901, the anti-Marxian theories advanced by Bernstein were again rejected; but this was probably done from a feeling of consistency, and a writer in the *Annals* remarks that recent events and present tendencies give some ground for the expectation that Social Democracy on the Continent will become a democratic rather than a purely proletarian movement. A detailed treatment of socialistic activity during 1901 will be found under AUSTRALIA, COMMONWEALTH OF; BELGIUM; FRANCE; ITALY; NEW ZEALAND; NORWAY; SWEDEN; and SWITZERLAND.

SOCIAL SCIENCE ASSOCIATION, AMERICAN. Founded 1862. Object: Investigation of the problems of social organization. Its objects are classified in five departments: Education and Art, Health, Trade and Finance, Social Economy, and Jurisprudence. The society has about 1,000 members. Officers, 1901-02: President, Hon. Oscar S. Straus, New York City; first vice-president, Frederick J. Kingsbury, LL.D., Waterbury, Ct.; general secretary, Frederick Stanley Root, M.A., 129 East Fifteenth Street, New York. The thirty-ninth annual meeting of the association was held at Washington, April 15 to 19, 1901. Twelve papers were presented under four departments, Trade and Industry not being repre-

sented. The principal papers presented at the meeting were as follows: *The Life and Public Services of the Late President of the Association*, Charles Dudley Warner, by Professor William M. Sloane; *Lawyers' Work Among the Poor*, Rosalie Loew; *The Latin-American Constitutions and Revolutions*, John W. Foster; *Transmission of Yellow Fever by the Mosquito*, Surgeon-General Sternberg; *The Outlook for the Education and Progress of the Colored Race in the Light of Present Reactionary Tendencies in the South*, Kelley Miller, George R. Stetson, William T. Harris; *The Future of the Library Movement in the United States in the Light of Andrew Carnegie's Recent Gifts*, Melvil Dewey; *The Best Treatment of Criminals, Whether Felons or Misdemeanants*, E. R. Brockway. See also CHARITY ORGANIZATION; CRIME.

SOCIAL SETTLEMENTS. The December *Bulletin* of the Bureau of Labor Statistics of New York, for 1900, contained a thirty-page article on social settlements, giving a well summarized outline of their history and development, their aims and activities, together with more detailed accounts of the work of the settlements of New York City. This article, which is now embodied in the eighteenth annual report of the Bureau of Labor Statistics, recently published, is an addition to the bibliography of settlements.

The Commons, the publication of the Chicago Commons, is recognized as the most valuable source of information for current news regarding settlement work. The College Settlement Association has adopted it officially as its organ. One paper is published with each issue, which is edited by Mrs. Caroline Williamson Montgomery.

An account of the University Settlement of Philadelphia appears in the last edition of the *Bibliography of Settlements*. This settlement was started on a small scale in the spring of 1899. In November of 1900 larger quarters were entered, an old tenement at 2623 South Street having been renovated for the purpose. A gymnasium, reading-room, library, game-room, and bath are provided. The boys are divided into two classes—those who pay ten cents for membership cards, and have the use of the game and reading rooms; those who pay an initiation fee of twenty-five cents and dues of five cents a week, for which they are instructed in history, geography, arithmetic, drawing and music, and have the use of the gymnasium. The girls are organized into clubs and classes for physical exercise, singing, cooking, and sewing. Lectures on Saturday evening and religious meetings on Sunday evening are open to both boys and girls, about 150 in number. A men's department for boys over eighteen has developed out of a debating club. This work is carried on under a graduate advisory committee of the Christian Association. It is a students' enterprise and twenty-five students give one evening a week to the work. The girls are supervised and taught by Philadelphia women.

Among the new settlements started in 1901 are the West End House, in Chicago, situated on the West Side near Hull House, and the West Side Neighborhood House of New York, an outgrowth of Armitage House. The latter was opened October 29 in a building at Tenth Avenue and Fiftieth Street, the money for which was given by Mr. John D. Rockefeller, Jr.

What might be called a traveling settlement has been started in the Kentucky mountains by Berea College. In the fall four parties with wagons went to remote counties, staying three days in each place, and giving stereopticon talks on agriculture, domestic science, good citizenship, and the building of public schools. In North Carolina, Mr. John T. Patrick has organized a traveling kitchen car and library in charge of two housekeepers, who stop at different places and show the people how to cook.

Mr. Everett P. Wheeler, president of the East Side Settlement, New York, believes the result of the recent election in that city shows the great value of settlements in calling attention to evils in different localities of the city that can only be perceived by persons living there. "In our own neighborhood we can see that the effect of our work, extending over a period of eleven years, has been distinctly to raise the standard of the whole community."

SOCIETY ISLANDS, a French colony in the Pacific lying to the east of Samoa. The two important islands are Tahiti and Moorea. Tahiti has an area of 600 square miles, and a population in 1900 of 10,750, mostly Polynesian natives. The chief town is Papeete, having 4,282 inhabitants, of whom 2,490 are French. The French budget for 1901 carried an item for Tahiti expenses of 818,137 francs (franc equals 19.3 cents). The local budget of 1900 balanced at 1,237,456 francs. The principal products are copra, sugar, rum, mother-of-pearl, etc. Food stuffs and cottons are imported, the United States supplying the greater part, France and French colonies coming next. Moorea has an area of about 50 square miles, and a population of 1,596.

SOCIOLOGY. The literature of sociology during 1901 was enriched by two important contributions to the theory of the subject, *Inductive Sociology*, by Pro-

fessor Franklin H. Giddings, and *Social Control*, by Professor E. A. Ross. *Inductive Sociology* is addressed exclusively to the teacher and investigator. "The object of this book," says the author, "is to present a scheme of inductive method, a somewhat detailed analysis and classification of social facts, and a tentative formulation of the more obvious laws of social activity—all as a basis for further inductive studies." The book consists of (1) a concise statement of the general principles of social evolution in a highly generalized form and with a thorough classification; (2) a considerable body of illustrative and explanatory material, supplementing these generalizations; and (3) 127 schedules of inquiry, which are intended to direct the observer in the collection and arrangement of social facts and from which, the author hopes, further generalizations may be made.

The materials of sociology, in the opinion of the author, are social phenomena, which he defines as "the interchange of ideas and sympathies by resembling individuals, their cultivation of acquaintance and like-mindedness, their comradeship and cooperation . . ." Sociology "aims to become a complete scientific description and history, and as nearly as possible a complete explanation of society in terms of simpler phenomena." Sociology is also compared with history: "To a great and increasing extent the field of the sociologist is the same as that of the historian. . . . To the extent that the historian is scientific he is a sociologist." In a more narrow sense, sociology is defined as social psychology in that it deals with what the author calls the social mind. This much misunderstood concept the author explains as follows: ". . . It means only that individual minds act simultaneously in like ways and continuously influence one another; and that certain mental products and practical consequences result from such combined mental action, which could not result from the thinking of an individual who had no communication with his fellow-beings." The basal social fact is "like response to stimulus." "From time to time . . . we observe coexisting individuals who are so constituted that they *respond in like ways to the same stimulus*. Like response is the beginning of that practical and mental resemblance which ultimately makes society possible. Like response to stimulus has four stages: (1) Appreciation, during which the individual comprehends his environment; (2) utilization of the environment; (3) characterization, the modification of character by contact with environment; and (4) socialization, or man's adaptation to his fellows. Like response to stimulus results in four main types of mind: (1) Ideo-motor, which might be called reflex-reactionary; (2) ideo-emotional, a type imaginative, influenced by external suggestion and without much reasoning power; (3) dogmatic emotional, whose beliefs are influenced by controlling ideas; and (4) critical-intellectual, the highest of all. Like response to like stimulus has five stages of development: (1) Monetary like response; (2) habitual like response; (3) mental and practical resemblance; (4) the consciousness of kind; and (5) concerted volition." The fourth stage, consciousness of kind, marks the beginning of social evolution. It is defined as ". . . that pleasurable state of mind which includes organic sympathy, the perception of resemblance, conscious or reflective sympathy, affection, and the desire for recognition." Concerted volition results from the "consciousness of kind" and is discussed as cooperation. Cooperation is treated as to nature, causes, forms, extent, and results. The results in ideas and activities appear in the cultural, economic, moral, and political spheres. Four modes of cooperation are enumerated—instinctive, sympathetic, formal, and deliberative like-mindedness, corresponding to the degree of mental development in the cooperators. The laws of concerted volition are formulated under three general heads: (1) Impulsive social action; (2) tradition; and (3) social preference. As an example of Professor Giddings's formulations, the law of preference is stated as follows: "In all social choice the most influential ideas are those of the forceful man, the powerful community, of virtue in the primitive sense of the word; second in influence are ideas of the convivial man, the prosperous and pleasure-loving community, the utilitarian or hedonistic virtues; third in influence are ideas of the austere man, the righteous or just community, the Stoic or Puritan virtues of self-restraint; fourth in influence are the ideas of the rationally conscientious man, of the liberal and enlightened community, of the virtues of reasonableness, broad-mindedness, and charity; but if mental evolution continues, the higher types become increasingly influential." In Part III. the forms of social organization are discussed and the various types of societies from the smallest family unit to the largest national state—the social composition—are described with their relations and connections. This discussion is anticipated in Book II., Part 1, which deals with the elements and structure of society under the heads of: (1) Situation; (2) aggregation; (3) demotic composition, which treats of the variations of aggregation caused by variation of the physical type, age, sex, and kinship; and (4) demotic unity through amalgamation and autogeny, or self-perpetuation. In Part IV. are discussed the ends for which society exists, which are declared to be (1) the creation of public utilities, such as security, equity,

economy, and culture; and (2) the development of social personality. "The supreme result of efficient social organization and the supreme test of efficiency is the development of the personality of the social man. . . . If . . . the man is becoming ever better as a human being, more rational, more sympathetic, with an ever-broadening consciousness of kind—then, whatever its apparent defects, the social organization is sound and efficient." The features of social personality are vitality, mentality, morality, and sociality. The final subject discussed is "The Interaction of Society and Personality." The directions for social investigation which are met with throughout the book are extremely suggestive. Perhaps the best example follows the section on "Evidences and Extent of Deliberative Like-mindedness." "The evidences of deliberative like-mindedness . . . the sociologist must look for in a free criticism applied to religion and theology, in the development of inductive science, in the existence of a scientific system of political economy, in the substitution of objective evidence for oaths and ordeals in legal procedure, and in the unmolested criticism of governments by the body of citizens who organize and obey them." The subjective factors to be observed in any given society are as follows: (1) Like response, prompt or slow, intermittent or persistent; (2) imitateness, slight or great; (3) consciousness of kind, imperfect; (4) reciprocal consciousness of kind, quick; (5) suggestibility, quick; (6) susceptibility, great; (7) contagious emotion, great and easily aroused; (8) minds dominated by emotionally formed beliefs; (9) habitual mode of reasoning, deductive or inductive; (10) deference to tradition, great; (11) reverence for authority, great; (12) intolerance, strong; (13) minds dominated by critically formed judgments. For any given social group, these categories are to be filled out by the use of majority and minority symbols. Thus, if a large majority, 75 per cent. or more, are susceptible, opposite this category may be written (.75 +). In other cases, an arithmetical value can be given as when a population is to be divided on the basis of age of sex, and here the column is to be filled out with figures. Other columns are to be filled out with mere affirmations—yes or no. These directions for investigation constitute the most valuable feature of the book.

Professor Ross, in *Social Control*, confines himself to the elaboration of a minute section of the field covered by the comprehensive work of Professor Giddings. His book is really a discussion of what Giddings calls "The Laws of Concerted Volition." The problem which the author sets himself to solve he states as follows: "The members of an orderly community do not go out of their way to aggress upon one another. Moreover, when their pursuits interfere, they make the adjustment necessary to escape collision, and make it according to some conventional rule. . . . By what means is the human struggle narrowed and limited? How has violence been purged away from it? How has the once brawling torrent of conflicting personal desires been induced to run smoothly in the channels of legitimate rivalry, or even for a time to vanish underground in those numerous cooperations where conflict is absent until it comes to dividing the results?" The subject is discussed under the following general headings: (1) The Grounds of Control; (2) the Means of Control; and (3) the System of Control. The grounds of social control include "what human nature can furnish in the cause of social order; . . . what abutments and spans are provided by the individual himself." These are sympathy, sociability, the sense of justice, and individual reaction against injury. Professor Ross believes that, under some circumstances, where population is homogeneous in character and possessions, social order can be maintained by the force of these elements which inhere in human nature, as actually occurred during the early days of California. In the remaining chapters of Part I, he discusses the Need of Social Control arising out of the increasing heterogeneity of society, the inequality of property conditions, and the entrance into society of the predatory classes; the Direction of Social Control, which so exercised enters to compel men to do or to refrain from doing; and the Radiant Points of Social Control, which are the centres—the army, the church, the officials, the capitalists—from which social control is exercised. Part II. deals with The Means of Social Control, which are as follows: (1) Public opinion; (2) law; (3) belief, or supernatural sanction for conduct, social suggestion—which may appear as a variation of hypnotism, usually operative upon persons of constricted environment; (4) education; (5) custom; (6) social religion—the conviction that there is a bond of ideal relationship between the members of a society and the feelings which arise in consequence of this conviction, an example of which is "human brotherhood;" (7) personal ideals, either one's own standard of self-respect, or a type of character which is handed down from one generation to another as embodying the most worthy traditions of the race; (8) ceremony; (9) art, which arouses the passions, exploits the æsthetic sense and the sense of the sublime, and fascinates with new types; (10) personality, or hero-worship; (11) enlightenment, illusion; (12) social valuations, "which result in a disappearance of those suggestions and ideas which are felt to be un-

favorable to the social welfare; (13) the elite, or the influence of a knightly, aristocratic, poetic, or priestly ideal hardly to be distinguished from the ideals above noticed; (14) the maintenance of ethical elements by reverence for the dead; (15) the influence of parents; and (16) the influence of those whose professed business it is to keep order. In Part III., under the System of Control, Professor Ross discusses first the means by which one class lives at the expense of the rest of the community. He concludes that the only tools which are at the disposal of a parasitic class to enable it to maintain its position are law; belief in the supernatural custom, ceremony, and illusion, all other means of control, are unavailable for this purpose. The vicissitudes of social control are also described. These are due to changes in social need: the rise and strife of classes, the changes in the culture and habits of a people due to the accumulation or borrowing of new knowledge, the acquisition of exotic wants, and new experiences. These influences operate to change both the location and the means of control. The means of control are classified into the ethical (including public opinion), suggestion, personal, ideal, social religion, art, and social valuation. These means of control draw their strength from the primal moral feelings; and "those pertaining to policy;" the political, including law; belief; ceremony; education; and illusion. The political means of control are chiefly employed in a régime of status to confirm the privileges and position of parasitic classes, and the ethical are preferred in a régime of contract, where population is homogeneous, culture uniform, and where the social constitution conforms to elementary justice. Social control, apparently so absolute, has certain boundaries which it cannot pass. Professor Ross formulates these limits in the following four canons: (1) "Each increment of social interference should bring more benefit to persons as members of society than it entails inconvenience to persons as individuals;" (2) "Social interference should support the sentiments that are the support of the natural order;" (3) "Social interference should not be so paternal as to check the self-extinction of the morally ill-constituted;" (4) "Social interference should not so limit the struggle for existence as to nullify the selective process." Finally, the criteria of social control, the standards by which to choose from the various means available, are economy, simplicity, and spontaneity. A work of such detail as this book, which is in fact a combination of an extended series of articles in the *American Journal of Sociology*, cannot be adequately characterized within the narrow limits of this article. So crowded are its pages with observations, deduction, and illustration, that a formulation of its content in general terms is almost impossible. In general description of its style, however, it is safe to say that this book offers one of the most readable descriptions and classifications of social forces that has yet been published in the English language. It sets a high ideal in the matter of style and arrangement to English writers on social topics. *Social Control* will be widely read because there is not a dull page between its covers.

Among sociological books of the year, Calkins's *Substitutes for the Saloon* is worthy of special notice. This book is the third in the series of volumes now being prepared for the Committee of Fifty. The author recognizes that the saloon supplies certain fundamental wants of the working classes, and hence has a measure of social justification for its existence. It is the workingman's club, offering for a small sum a warm, clean, attractive meeting-place for the evening, and a satisfactory noon meal at a lower price for both food and drink than is charged by the ordinary restaurant for food alone. In other words, the saloon satisfies social instincts, and if it is to be successfully combated, those instincts must be satisfied in some less objectionable manner. Some of the more important agencies of substitution are gymnasia, athletic fields, coffee houses, clubs, cheap theatres, free lectures and musical entertainments, and low-priced restaurants run at cost in order to compete with the free lunch. Mr. Calkins is emphatic in his indorsement of the effectiveness of the institutional church in combating the saloon. He recognizes, however, that men cannot be stopped from drinking, no matter what agencies may be employed, and therefore argues in favor of institutions such as the workingmen's clubs of Great Britain, where liquor is sold without profit to the manager as being, all things considered, the most effective means of combating the saloon. In the United States, workingmen's clubs are rapidly increasing in numbers, and here the rule is to apply the profits from the sale of liquor to the club expenses. These clubs almost universally discourage drunkenness or even drinking to the point of hilarity, as lessening the attractiveness of the institution to prospective members and injuring its repute in the neighborhood. In encouraging the growth and multiplication of these clubs, the most effective work in opposing the saloon can be accomplished.

Chapter XXVIII. of the *Report of the United States commissioner of education*, contains a report by Mr. Lester F. Ward on *Sociology at the Paris Exposition of 1900*. Of particular interest at this time is the programme adopted by the

International Congress for Social Education, as a general method for the study of social facts.

I. GENERAL METHODS.

1. Establishment of the facts of natural solidarity. (a) Phenomena of interdependence—In nature (family, epidemics, climate, etc.). In history (groupings of races, classes, countries, opinions, etc., according to external conditions. (b) Analogous social phenomena: Facts of hygiene (public health, diseases, infirmities due to the bad distribution of labor, charges for medical attendance, etc.). Economic facts (production, consumption, strikes, public works, etc.).
2. Theoretical and philosophical study of social solidarity: (a) Foundation of the idea of solidarity, its nature, its limits, its relations with the idea of liberty and with the idea of justice. (b) General laws that govern the relations of social beings, consecutive sanctions.
3. Consequences of the law of solidarity applied to social relations among individuals: (a) Differences of appreciation and of opinion according as one is an individualist or a solidarist. Advantages of solidary (collective) action; the interests of individuals are harmonious and not opposed; necessary substitution of the idea of solidary (collective) struggle of men for existence with external obstacles, for the idea of individual struggle between men. (b) Influence of social education on the organic character of society. Need of this education in order to arrive at right founded on the principle of justice.

II.

1. Diffusion of ideas of solidarity, theoretical, and objective teaching: (a) Duties, readings designed to make known the facts of solidarity, then the principles that govern them and the laws that result from them. (b) Applications to the existing facts in the school, in the family, in the general environment.
2. Development of social sentiment: (a) Practical action conformable to the principle of solidarity; organization of temporary groups and with a special object. (b) Enforcement of solidary action in these groups; encouragement of private initiative, of the recognition of abilities brought out by circumstances, etc.
3. Exercise of the social sense: (a) Organization of groups of children and men for all cases in which solidary action can be efficacious. (b) Creation of an environment in which the individuals shall have to act from a social interest; to practice an exchange of services, solidarity between strong and weak; to learn the mechanism of collective action; to acquire administrative experience, the knowledge of capacities, the voluntary acceptance of the opinion of the largest number—in a word, all that conduces to the intelligent organization of free individual initiative. (c) The putting into practice of solidarity in all matters of social life in which individual initiative can be exercised; education of the less informed by the better informed; solidarity in the family, in the regiment, in work, in production, in consumption, in mutual aid, etc.

III. PRACTICAL APPLICATION.

1. General characteristics of collective work: (a) Denominational propagandist work; its special conditions. (b) Works of charity; distinction from works of solidarity. (c) Works of solidarity; organization, social efficiency.
2. Examination of work now going on, progress attained. (a) Pure practical work (aid to orphanages; dispensaries). (b) Practical educational work (student and alumni associations, mutual aid associations, syndicates, federations, cooperative associations, etc.). (c) Theoretical propagandist work (lectures, libraries, journals, reviews).
3. Conditions to be established for the improvement and perfection of the operation of collective work. (a) Conditions relating to the foundations and administration of such work. (b) Nature of the progress to be realized through the initiative of citizens. (c) Works to be founded in order to complete the sum total of collective operations necessary for social education.

Social pathology received two important contributions during 1901. The author of Boies's *Science of Penology* is a member of the Board of Public Charities and of the committee on lunacy of the State of Pennsylvania. The purpose of the author is "to collect the principal data," to arrange them in order, and to state the generally accepted conclusions of penologists. The subject is treated under three general heads: I. Diagnostics; II. Therapeutics, and III. Hygienics—or the diagnosis, cure, and prevention of crime. Part I. defines the science of penology, the criminal class, and crime; and discusses the methods of detecting and identifying criminals, the present status of criminal codes, and the institutions by means of which society is protected against the criminal. Under Therapeutics are discussed legal penalties in the United States; the use of the indeterminate sentence; the reformation of criminals within institutions; treatment of special classes

of criminals—drunkards, prostitutes, and the criminal insane, the habitual criminal, and juvenile offenders; prison labor; and the installation and management of reformatory institutions. Part III. treats of the various means by which crime may be prevented, prohibition of marriage of the unfit, the care of neglected or abandoned children by the State in institutions and in the public schools, and includes a discussion of penological ethics with special reference to their abuse in criminal trials. The discussion is generally adequate and the author is on advanced ground in most of his positions. Of peculiar value are the chapters on: The Reformation of Criminals; The Criminal Insane and Criminal Converts; and Prison Labor.

Professor Charles R. Henderson's *Introduction to the Study of the Dependent, Defective, and Delinquent Classes* is a new edition of the author's work on the same subject published some years ago; but with much new material added. The book is divided into five parts: Part I. is a statement of the problem presented by the presence of "Social Debtors" in society, and explaining the origin of this class; Parts II. and III. deal with the relief and care of dependents and defectives and also with almost every phase of relief work. Part IV. is a résumé of the science of penology. The book closes with a "Survey and Outlook," and an appendix which presents a large amount of material equally valuable to the student and the practical worker.

Mention should also be made of Devine's *Practice of Charity*; Flynt's *Powers that Prey and The World of Graft*; and Thomas's *The American Negro*, as belonging in the sociological literature of the year.

The *American Journal of Sociology* during 1901 contained several important studies of typical social groups. Of these may be mentioned *Some Social Aspects of the Chicago Stock Yards*, by Charles J. Bushnell, and *The Culture Agencies of a Typical Manufacturing Group; South Chicago*. These are microscopic studies of social and economic conditions within areas so limited that the investigator can supply the scanty material of general statistical records by personal observation, and the result is two vivid pictures of social conditions. Mr. Bushnell's work is distinguished by an abundance of illustrative material in the form of social maps and charts showing, for example, the distribution of foreign population and child mortality, public institutions and criminality, families in distress, contributors to the Bureau of Associated Charities, and scale of family incomes in the stock yards district, and also by a large number of photographs illustrating the life of the district. Professor Albion W. Small has continued his series of articles on *The Scope of Sociology*, in which he expounds his concept of sociology as a synthesis of all other social sciences, and Miss Sarah E. Simons has begun a series on *Social Assimilation*, which is a study of the methods of race amalgamation.

SOMALILAND, the most eastern part of Africa, bordering the Gulf of Aden and the Indian Ocean, consists of three dependencies belonging to Great Britain, France, and Italy.

Somali Coast, a British protectorate lying between the French and Italian dependencies, has an estimated area of 68,000 square miles and a population which has been placed at about 240,000. The chief town is Berbera, on the Gulf of Aden. The protectorate is administered by a resident official under the British foreign office. The revenue and expenditure for the fiscal year 1900 were Rs. 385,884 and Rs. 340,092 respectively (the rupee is worth 32.4 cents). The products are chiefly hides and skins, gum, ivory, and ostrich feathers. The imports in the fiscal year 1900 amounted to Rs. 6,787,555 and the exports Rs. 5,885,675.

In 1901, British and Abyssinian military operations were carried on in northern Somaliland and eastern Abyssinia against the "Mad Mullah," Haji Mahamed Bui Abdullah, whose depredations had become excessive. By April 1 a British force of 1,500 men was ready to advance from Adadlah, 50 miles west of Berbera, and about the end of the month final arrangements were made for a joint Anglo-Abyssinian expedition. Meanwhile the Abyssinian advance guard had forced the Mullah to retreat and captured thousands of ponies, sheep, and camels. The joint expedition was placed under command of Colonel Swayne for the British, and Ras Makonnen, assisted by two British officers, for the Abyssinians. Having left Burao on May 22, the British force reached El Dab on the 28th and two days later defeated the Aden Madoba and Jama Siad tribes, who were fanatical supporters of the Mullah. A zariba was formed at Gebilo. About the same time Abyssinian troops dispersed certain followers of the Mullah and returned to Harar, bringing with them, it was reported, 25,000 head of cattle as booty. On June 4 the British were victorious near Assura and on the following day burned the Mullah's headquarters at Welahed. Meanwhile, however, the zariba was attacked (June 2 and 3), but unsuccessfully. About the middle of June an Abyssinian force, reported 15,000 strong, arrived at Gerloguby; failing, like the British, to capture the Mullah, they attacked a tribe supporting him, the powerful Rer Ibrahim, who were pursued for three days and suffered heavy losses. The British force under Colonel Swayne encountered the

Mullah near Hassan Ughaz on July 17, and defeated him, inflicting considerable loss. Both the British and the Abyssinian troops were withdrawn, since there was a scarcity of food and the forces of the Mullah appeared to be effectually scattered. About the middle of November it was reported that the Mullah, with a few followers, had fled to the desert country of the Mijertain, which is under Italian protection. The aggregate forces of the Mullah were said to have numbered about 40,000 men, including 8,000 cavalry. Several engagements of this campaign were hotly contested and the total losses of the Mullah were considerable.

Somali Coast and Obock, a protectorate and a colony respectively of France, have a combined area of about 5,000 square miles and a population of about 22,000. The capital is the port Jibouti, which has about 15,000 inhabitants. The country is administered by a governor. Additional territory embracing an area of perhaps 40,000 square miles with a population of some 200,000 is under French influence. The local budget for 1900 balanced at 581,000 francs (the franc is worth 19.3 cents), while the estimated expenditure of France both for 1900 and for 1901 was 337,500 francs. The trade is largely with France. A railway is being constructed from Jibouti to Harar, in Abyssinia, 186 miles distant; the 125th mile was reached on December 17, 1901. It is feared that this line, when completed, will divert trade from British Somaliland.

Italian Somaliland, a protectorate, has an estimated area of 100,000 square miles and an estimated population of 400,000. The country, since November, 1899, has been administered by the Italian Trading Company of Benadir.

SOUDAN. See FRENCH SOUDAN and EGYPT (paragraph Egyptian Soudan).

SOUTH AMERICA comprises ten republics and three colonies, the aggregate area of which is estimated at about 7,400,000 square miles and the population at over 41,000,000.

Commerce.—The leading countries in South American trade are Great Britain, the United States, Germany, and France. The approximate values of the imports to and the exports from South America may be placed at \$350,000,000 and \$450,000,000 respectively. For trade by countries with the United States see UNITED STATES (paragraph Commerce). During 1901 attention was again called to the increasing success of German competition against British in South American trade. One of the important causes of this situation, it was said, is the superiority of the German over the British traveling agents in their knowledge of, and in their colloquial facility in using, the Spanish and Portuguese languages; while foreigners, employed as agents by British firms, are liable to impart the trade information thus gained to business men in their own country. The Germans also have an advantage by using attractive wrappings, which appeal to the South Americans, and light packing, since the customs duties are generally levied according to gross weight. German trade with the principal South American countries in 1900 was as follows, the figures representing the imports to and the exports from South America respectively: Argentina, \$15,232,000 and \$55,734,800; Brazil, \$10,876,600 and \$27,489,000; Chile, \$9,490,200 and \$21,277,200; Peru, \$2,356,200 and \$1,642,200; Uruguay, \$2,856,000 and \$3,665,200; Venezuela, \$1,190,000 and \$2,308,600. It is seen that the commerce of the first three countries with Germany is considerable, the imports and exports in 1900 amounting to \$35,604,800 and \$104,501,000; corresponding figures for the preceding year were \$30,202,200 and \$90,178,200. German investments are estimated to aggregate a value of 600,000,000 marks in Brazil (the mark equals 23.8 cents), 200,000,000 marks in Venezuela, and 100,000,000 marks in Chile; it may be added here that the investments in Mexico and Guatemala are placed at 180,000,000 marks and 140,000,000 marks respectively.

One of the principal imports to South America is cotton goods and in this trade Great Britain has the leading place. Attention has been drawn to the feeble competition of the United States, as compared with her capabilities, in this trade. In the three years 1898, 1899, and 1900, the aggregate number of yards of British cotton goods imported by Latin-American countries was about nine times that of American manufacture. The import of British cotton goods by the South American republics (that is, not including Mexico and Central America) was reported at \$23,269,435 for 1899 and \$23,989,518 for 1900, while American cottons were imported in the two years to the value of \$1,996,102 and \$2,461,094.

History.—Unstable political conditions in South America continue. During 1901 the revolution in Colombia was kept up, an insurrection broke out in Venezuela, and in addition there was considerable friction between the two governments, while Colombia was suspicious of the attitude of Ecuador. A bitterly fought presidential election took place in Chile, there were political troubles in Uruguay, and at the close of the year a threatened revolution in Paraguay; an alleged monarchist plot was discovered in Brazil, and the mutual and long-standing jealousy of Chile and Argentina was intensified by a new territorial dispute. The characteristic insincerity in matters political often urged against the South American republics in general was

Latitude	56°	from	Greenwich	50°	H	45°	J	40°	K
----------	-----	------	-----------	-----	---	-----	---	-----	---

illustrated in the fall, when it was reported that Colombia had signed a secret treaty with Chile, whereby the former undertook to support the latter at the Pan-American conference at Mexico, and Chile promised to supply Colombia with munitions of war against Venezuela. Also in the fall of 1901 a serious dispute developed between Venezuela and Germany.

The second Latin-American Scientific Congress convened at Montevideo on March 20, 1901. Señor Robert Wernicke, an Argentine delegate, was chosen president. Over 100 delegates representing nearly all the Latin-American countries were in attendance. The sessions continued for two weeks, and a large number of papers on scientific, historical, and sociological subjects were presented. The first congress was held in Buenos Ayres in 1898. See the articles on the several countries and Mexico (paragraph Pan-American Conference).

SOUTH AUSTRALIA. A state of the Commonwealth of Australia, with an area (including the northern territory) of 903,690 square miles. The population at the census of 1901 was 362,595, against 320,431 in 1891, an increase of over 13 per cent. as compared with 14.5 per cent. for the preceding decade. Capital, Adelaide, with a population of 160,691, including the suburbs.

Government and Finance.—At the head of the administration is the governor appointed by the crown and assisted by a cabinet of 6 ministers. The legislative council consists of 24 members elected for three years on a slight property qualification. The house of assembly is composed of 54 members elected for three years by universal adult suffrage, regardless of sex. The revenue and expenditure for 1901 were estimated at £2,869,377 and £2,867,857 respectively. The revenue is obtained mostly from customs and public services. The debt amounted at the end of the fiscal year 1900 to £26,156,180.

Industries, Commerce, etc.—The area under cultivation in 1901 was 3,279,406 acres; of which over 1,900,000 acres were under wheat, and the rest under barley, oats, and vine. The live stock of the state consisted in 1900 of 5,235,000 sheep, 214,761 head of cattle, and 166,790 horses. The mineral output (consisting chiefly of copper and silver) was valued in 1899 at £453,020. There are over 30 iron and brass furnaces and about 20 establishments for the manufacturing of agricultural implements. In 1899 there were altogether 820 factories employing about 15,000 hands. The imports and exports of South Australia for 1900 amounted to £8,034,552 (£6,884,358 in 1899) and £8,029,157 (£8,388,396 in 1899) respectively. The trade is chiefly with the United Kingdom and the other states of the Commonwealth, and the main exports are wool, grain, and copper. The state railway lines had 1,737 miles in operation in 1900. The total cost to December 31, 1900, was £13,109,784, and the net revenue for 1900 amounted to 3.92 per cent. on the capital invested. The telegraph lines have a total length of about 6,000 miles.

History.—In April, 1901, the government of South Australia through the premier, Hon. Frederic W. Holder, formally asked the Commonwealth to assume control of the Northern Territory, hitherto administratively a part of South Australia, on the ground that federal policy having been announced as hostile to the continuation of Asiatic and Polynesian labor, the burden of the territory should be borne by the Commonwealth. With this exception, there was little opposition in the state during the year, to the policy of a "white Australia," enunciated by the federal ministry. The race problem before South Australia differs materially from that in Queensland. In the latter state the Kanaka laborer is in close competition with the white, while the Northern Territory of South Australia, where the Asiatic population lives, is so far removed from South Australia proper as to present financial difficulties rather than a race problem, although in Palmerston, the capital of the territory, the Japanese actually constitute a majority of the population, and control most of the business. Owing to the appointment of Premier Holden, as speaker of the Commonwealth House of Representatives, a new ministry, with Mr. J. G. Jenkins, as premier, was formed May 14, 1901. At the opening of parliament on July 18, the governor announced that bills would be introduced to reduce the number of members of parliament by one-third, to provide for single electorates for the assembly, and to reduce the number of ministers from 6 to 5. South Australia has not been so radical in its social and economic legislation as the other states in the Commonwealth, and there was no attempt to extend its control along such lines during 1901. In June there was a serious masons' and builders' strike in Adelaide.

SOUTH CAROLINA, a southern Atlantic State of the United States, has an area of 30,570 square miles. The capital is Columbia. The population in 1900 was 1,340,316, while in June, 1901, as estimated by the government actuary, it was 1,360,000. The populations of the three largest cities in 1900 were: Charleston, 55,807; Columbia, 21,108; and Greenville, 11,860.

Finance.—At the beginning of the fiscal year ending December 31, 1900, there was a balance in the treasury of \$626,912.05. The receipts during the year were \$3,391,-

774.87, the expenditures \$3,780,043.67, leaving, December 31, 1901, a balance of \$237,743.25. On the same date, the State debt amounted to \$6,846,082.78.

Industries.—Although South Carolina is an agricultural State, the census reports for 1900 show there has been a considerable growth in its manufacturing and mercantile industries in the last half century. Since 1850 the population has increased from 668,507 to 1,340,316, or 100.5 per cent., while the average number of industrial wage-earners has increased from 7,066 to 48,135, or 581.2 per cent., embracing in 1900 3.6 per cent. of the entire population, compared with 1.1 per cent. since 1850. In 1900 the capital invested in the 3,762 industrial establishments reporting was \$67,356,465, exclusive of capital stock; the gross value of the products was returned at \$58,748,731, while the net value, exclusive of material re-used in the process of manufacture was \$48,175,365. Cotton manufacturing is by far the most important industry of the State, having products in 1900 valued at \$29,723,919, or 50.6 per cent. of the total value of the products of the State. The increase in the value of cotton products during the decade was \$19,923,121, or 203.3 per cent. South Carolina is now second among the southern States only to Georgia in the amount of her cotton products. The manufacture of lumber and timber products ranks second among the industries of the State, with products in 1900 valued at \$5,207,184, an increase since 1890 of \$3,060,434, or 142.6 per cent. Another large industry of the State is that of the manufacture of fertilizers, whose products in 1900 were valued at \$4,882,506, an increase since 1890 of \$464,848, or 10.5 per cent. Flouring and grist-mill products had a value in 1900 of \$2,347,790, an increase since 1890 of \$264,604, or 12.7 per cent. In 1870 and 1880 this was the leading industry of the State, but has relatively declined since then, and the State is now largely dependent upon the West for its supply of flour.

Constitutional Amendments.—On February 8, 1901, the legislature ratified two amendments to the constitution which had been proposed to the electors by the legislature on February 9, 1900, and had been approved by them at the succeeding general election. These amendments were as follows: The first gave the General Assembly power to provide by law for the condemnation of all lands necessary for the proper drainage of the swampy and low lands of the State, and to provide for the assessment of the lands drained for the purpose of paying the expenses of the condemnation and drainage. The second amendment provided that the constitutional mandate prohibiting cities from incurring a bonded indebtedness in excess of 8 per cent. of the assessed valuation of the property, should not apply to the cities of Columbia, Rock Hill, Charleston, and Florence, where the additional indebtedness was solely for water and sewerage systems, or to the city of Georgetown if the additional indebtedness was either for those purposes or for the purpose of instituting electric lighting plants.

Corporation Laws.—Corporation laws passed by the legislature were as follows: The amount of land which any alien or any corporation controlled by aliens might own in the State was limited to 500 acres. The rights and remedies of employees of railroad corporations, as provided for in the constitution, were extended to apply to employees of street railway corporations. A former law permitting railroads forming a continuous line to merge or consolidate was amended by enacting that nothing therein should be construed to give permission to parallel and competing lines to merge. An act was passed requiring the railroad commission to fix maximum rates for the storage of freight by railroad companies; giving the commission power to vary this rate according to the value and character of the freight stored, the place of destination, and other pertinent factors, and forbidding railroads from making greater maximum charges than that fixed by the commission or directly or indirectly discriminating between shippers by means of rebate or other devices. Telegraph companies were made liable for damages for negligence in transmitting or delivering messages. Corporations or individuals were prohibited from paying their laborers in any memorandum or token of indebtedness unless this token was redeemable in cash within 30 days; this restriction was not to apply to agricultural contracts or advances made for agricultural purposes.

Other Laws.—Other laws passed by the legislature were as follows: The consent of South Carolina was given to the acquisition by the federal government of such lands as might be necessary in South Carolina for the establishment of the proposed Appalachian Forest Reserve Park. The real estate sold by a sheriff for back taxes was directed to be redeemable on payment of taxes, penalties, costs, and 8 per cent. interest thereon, either by the owner or by a mortgage creditor. The superintendent of the penitentiary was directed to hire out convicts to the several counties to work on the public highways, compensation for their services to be at the rate of \$4 per month, board, and clothing. The office of State geologist was created, and the geologist appointed under the act was directed to make such reports on geologic formations and mineral deposits in the State as might be useful to its citizens. An act was also passed creating a State board of entomology and providing for the

inspection by the board of fruit trees, vineyards, and vegetable farms in order to prevent the damaging of these by destructive insects. The total amount of money which the State might pay yearly to ex-Confederate soldiers residing in the State was increased from \$100,000 to \$150,000. An act was passed providing for the incorporation and prescribing the government for cities of more than 5,000 inhabitants. A curious law passed, prohibited the sale, manufacture, or importation into the State of pistols less than 20 inches long or weighing less than 3 pounds. And all persons were prohibited under penalty of \$100 fine from carrying pistols under this weight and length; it was provided, however, that the magistrate, if satisfied that the carrier of the pistol "had good reason to fear injury to his person or property," might suspend sentence. Apparently this act was intended to reduce the number of homicides in South Carolina, which of recent years have been averaging over 200. An important bill for the restriction of child labor was passed by the Senate, but the House refused to concur in it. This bill provided that after May, 1901, no child under ten should be employed by any mercantile establishment, none under eleven after May, 1902, and none under twelve after May, 1903. The press generally favored the bill; but the greater number of mill owners argued against it, alleging that it would cripple the cotton mill industries by driving the negro families to adjacent States which did not have such a law. The refusal of the House to concur in the bill was accentuated by its rejecting by a vote of 33 to 68 a bill for the compulsory school attendance of children under twelve. Resolutions were introduced in the House commending Senator Tillman and condemning Senator McLaurin for having aligned himself with the Republicans on the questions of the Philippine policy and the Ship Subsidy Bill. The House adjourned, however, without passing the resolutions or declaring its policy in the premises.

Tillman-McLaurin Controversy.—During the year the long-standing controversy between the senior Senator from South Carolina, Benjamin R. Tillman, and the junior Senator, John L. McLaurin, came to a definite focus. This not only created much excitement in the State itself, but aroused wide discussion in the country at large on account of the larger national issues that the dispute ultimately involved. The original controversy appeared to date from the time that the Treaty of Paris was ratified by the Senate early in 1899, and was sharpened by the widely different character of the two principals. Senator Benjamin R. Tillman, elected to the Senate in 1895 and again in 1901 for the full term ending 1907, first came into prominent notice by his so-called "pitchfork" attacks on President Cleveland, and by the part he took in formulating some of the more radical planks of the Democratic platform in the convention of 1896. Again in the national campaign of 1900, Senator Tillman was one of the few Democrats of note who squarely faced the issue presented by the Republicans as to the disenfranchisement of negroes in the South, admitted that he had been the central figure in the South Carolina constitutional convention of 1895 which instituted an educational qualification for the suffrage, and asserted that the negro was the peculiar burden of the South which it should be allowed to carry in its own way. While Mr. Tillman had vehemently assailed Mr. Cleveland, he no less vehemently assailed the imperialistic and domestic tariff policies of the Republican party, and both his manner of opposing these policies and his ultra radical Democratic attitude earned for him the title of "Populist." Senator McLaurin, on the other hand, elected in 1897 for the senatorial term ending March 4, 1903, joined issue with the adherents of Bryan in the Democratic party, and early became, so far as votes were concerned, a Republican on the most important issues of the day. He was one of those who voted to ratify the Treaty of Paris in 1899, he favored a proper ship subsidy bill, and he favored a protective tariff, asserting that thus only could the South obtain the widest possible markets for its manufactures and cotton goods. In the matter of measures to be taken for curbing trusts, Mr. McLaurin was much more moderate than Mr. Tillman, believing that the entrance of Northern capital to the South and the building up of huge industrial concerns was the most pressing need for the financial reclamation of the States below Mason and Dixon's line.

Senator Tillman, secure, as he thought, in the affections of the people of the State, taunted Senator McLaurin upon his "Republican" point of view and dared him to send conjointly with Mr. Tillman his resignation from the Senate to M. B. McSweeney, the governor of the State, and trust to the people to reelect them. Senator McLaurin agreeing to this, a joint note was sent to the governor on May 25, resigning their commissions, the resignations to take effect on September 15, at which time it was proposed to hold primaries, stir up a general political agitation, and reelect one senator at the cost of the other. The governor, however, declined to entertain the resignations and they were accordingly withdrawn. Not content, however, to let the matter rest there, Senator Tillman, on July 25, at a meeting of the State Democratic executive committee, induced that body to read Senator McLaurin out of the party. The resolutions passed by a vote of 25 to 5, and set forth that the senator by voting with the Republicans and supporting their policies, had misrepre-

sented his constituency, ignored the national Democratic platform, and that honesty and self-respect therefore demanded that he immediately tender his unqualified resignation. In his reply, made public on August 6, Senator McLaurin stated that the Democrats throughout the State, and not Mr. Tillman and the executive committee, were the proper judges of his political record. In due time, the senator said, he would appeal to the people as to his course in aiding cotton factories, opening highways of commerce, and endeavoring to gain for the Democratic party the confidence and respect of the business laboring elements of North and South. Until then he would retain his place.

In commenting upon the matter, Southern papers seemed inclined to the view that so far as the personal equation was concerned, there was no especial reason why either senator should be "vindicated" at the expense of the other, or vindicated at all. As the *Columbia State* remarked, the amiable personality of one was balanced by his political treachery, and the good votes of the other by his "evil words and ugly record." And several other papers said that if both the present incumbents—the Populist and the Republican—were turned out, South Carolina would be pleased to elect two good Cleveland Democrats. The impersonal and wider aspects of the subject brought up the general question as to whether or not the South was to remain completely Democratic, irrespective of persons and irrespective of any national Democratic policy which might happen to be in force at the time. And the importance of this question was felt the more keenly on account of the President's trip in the South a few months earlier. The President's speeches at that time had produced a marked effect, and their argument was substantially, as tersely stated in New Orleans on May 1, 1901, as follows: "Protection for sugar and rice; harbor and river improvements; the open door to China that we may send the product of our cotton fields, made up into cotton goods, to the millions in the Orient; good money and plenty of it; territorial expansion; are we not all in agreement upon these things?" To this argument a large part of the Southern press agreed, the *Richmond Times*, stating in effect that formerly the fear of negro domination had kept all the whites in the Democratic party; but that this fear was now removed, and that consequently the many whites who believed in the principles and policies of the Republican party were now, or soon would be, free to follow their choice. And the *Charleston Post* said in the same strain: "The acquisition of the Philippine Islands will do more for the upbuilding and development of the South in general and for our Southern cotton growers and Southern mills in particular than any event that has or could possibly occur." It was asked whether the South should continue, in her impoverished condition, to stand for a Democracy inimical to trusts and corporations, favorable to free silver, and to some extent at least, subservient to a passionate if impracticable demand for the equality of men? Was it not rather to her present advantage to have several of even the extreme Republican policies, such as the Ship Subsidy Bill, enacted, and the federal laws for trusts kept lax? That this was the question which the Tillman-McLaurin controversy had definitely raised was fully admitted by Mr. Bryan, though his statement of it was naturally adverse. In the *Commoner* he said that Senator McLaurin's position "marks the beginning of a movement in the South which will have an influence upon the politics of the nation." "The aristocratic and plutocratic element for which the senator speaks is a growing one." "Corporations are increasing in number and magnitude in the South. The commercialism which has debauched municipal and State governments in the North will soon be apparent in the South."

Elections.—On January 15, Benjamin R. Tillman (Dem.) was chosen to succeed himself as United States Senator for the full term ending March 4, 1907. Senator Tillman had been affirmatively voted upon at the primaries in November, 1900, and he was elected unanimously by both branches of the legislature.

State Officers.—Governor, M. B. McSweeney, Democrat, term ending January 18, 1903; lieutenant-governor, James H. Tillman; secretary of state, M. R. Cooper; treasurer, R. H. Jennings; comptroller-general, J. P. Derham; superintendent of education, John J. McMahon; attorney-general, J. D. Bellinger. Supreme Court: Chief justice, Henry McIVER; associate justices, Y. J. Pope, Eugene B. Gary, and Ira B. Jones—all Democrats.

Congressional Representatives (57th Congress).—In the House: William Elliott, from Beaufort; W. Jasper Talbert, from Parksville; Asbury C. Latimer, from Belton; J. T. Johnson, from Spartanburg; David E. Finley, from Yorkville; Robert B. Scarborough, from Conway; and J. W. Stokes, from Orangeburg—all Democrats. In the Senate—John L. McLaurin (until 1903), from Bennettsville, Democrat, but voting with the Republicans on several important issues; and Benjamin R. Tillman (until 1907), from Trenton, Democrat.

SOUTH CAROLINA INTERSTATE AND WEST INDIAN EXPOSITION. In order to show to the world "the marvelous development of the South during the last quarter of the Nineteenth Century," and especially to exhibit the progress in

SOUTH CAROLINA EXPOSITION GROUNDS.

cotton manufacturers in South Carolina, as well as to show "the resources and industries of our new possessions in the West Indies, the Philippines, also of Mexico and the South and Central American Republics," it was decided to hold an exposition in Charleston, S. C., from December 1, 1901, to June 1, 1902. The General Assembly of South Carolina passed resolutions in January, 1900, approving the project of holding this exposition, and a corporation chartered by the State was organized with a capital stock of \$250,000, under the direction of F. W. Wagener, president; W. H. Welch, vice-president; Samuel H. Wilson, treasurer; John H. Averill, director-general; and John F. Ficken, general counsel. The following heads of departments were subsequently appointed: J. C. Hemphill, manager department of publicity and promotion; E. H. Pringle, manager department of ways and means; E. L. Tessier, Jr., manager department of exhibits and concessions; John F. Ficken, manager department of law and legislation; D. A. Tompkins, manager of textile department; and James B. Townsend, director of arts. In January, 1901, the State appropriated \$50,000 for the purpose of erecting a State Building on the exposition grounds, and the City of Charleston likewise appropriated \$50,000 to aid the exposition in its work, while the remainder of the funds were raised by subscription. A site, covering about 160 acres of land on the eastern bank of the Ashley River, about two and one-half miles from the business centre of the city, and within the city limits, was selected, on which the following buildings were erected: Agriculture, Commerce and Liberal Arts, Fine Arts, Machinery and Electricity, Minerals and Forestry, Negro, Textile, Transportation, and Woman's Educational, most of which were designed in the Spanish Renaissance style of architecture, and were covered with stucco, colored to resemble soft ivory with white trimmings, and in some cases enriched in shades of red and orange. The name of Ivory City has been given to the Exposition. Twenty-four States and cities of the United States made provisions for special buildings for exhibits at the exposition. A Midway, with the usual attractions, was an interesting feature of the exhibition. December 1 was the original date designated as the opening day; but when it was learned that that day fell on Sunday, it was decided to open the exposition with religious exercises appropriate to the day. The formal opening took place on December 2, with imposing ceremonies, including a parade of Federal and State troops, with Confederate veterans, and a programme of exercises that included an address by Governor McSweeney and an oration by United States Senator Chauncey M. Depew.

SOUTH DAKOTA, a northwestern State of the United States, has an area of 77,650 square miles. The capital is Pierre. Dakota was organized as a Territory, March 2, 1861, and was divided into the States of North and South Dakota, November 2, 1889. The population in 1900 was 401,570, while in June, 1901, as estimated

by the government actuary, it was 407,000. The largest city is Sioux Falls, with a population in 1900 of 10,266.

Finances.—The amount of money in the State treasury on July 1, 1900, was \$555,701.37. For the following fiscal year ending June 30, 1901, the receipts were \$1,738,587.24, and the expenditures \$1,529,400.15, leaving in the treasury, \$764,888.46. During the year, \$250,000 was added to the State debt. At the end of the year the total State debt was \$863,300, of which \$613,300 was bonded. The State tax rate for the year was 3.2 mills, and the total value of State property returned for taxation was \$173,206,733.

Industries.—Although the principal industries of South Dakota are agriculture and mining, the census reports of 1900 show a large increase in the manufacturing interests of the State since 1890. In that time, the population has increased from 328,808 to 401,570, or 21.1 per cent., and the average number of industrial wage-earners from 2,011 to 3,121, embracing in 1900, 0.8 per cent. of the total population. In the latter year, the amount of actual capital, exclusive of capital stock, invested in 1,639 establishments reporting was \$7,578,895, and the gross value of the products inclusive of materials re-used in the process of manufacture, \$12,231,239. Manufacturing is practically limited to "neighborhood" industries and almost the entire product is consumed at or near the point of production. Agriculture supplies the raw material for the most important industries, the making of flour and grist mill products valued at \$3,379,843, and of cheese, butter, and condensed milk valued at \$1,199,493.

Proposed Constitutional Amendments.—By a resolution of the South Dakota legislature the following proposed constitutional amendments were directed to be submitted to the electorate at the next general election: (1) Amending the constitutional provision providing that a county seat once located could only be re-located by a two-thirds vote, by providing that if a county seat was not located on the line of a railroad it could be so located by a three-fifths vote. (2) Providing that the rate of interest upon all investments of the permanent school or other educational funds should be reduced from 6 per cent. to 5 per cent. (3) Extending somewhat the purposes for which municipal debts might be incurred.

Legislation.—Among laws passed by the South Dakota legislature were the following: A uniform system of education was established under the superintendent of public instruction and the previous school laws were codified. It was directed that a course on the humane treatment of animals must be given in schools for at least 10 minutes each week, and "no experiment upon live animals to demonstrate facts in physiology should be permitted in any school of the State." An act to prevent the fusion of parties provides that if any candidate is chosen by two parties for the same office he must take his choice of which nomination he will accept; he cannot appear on the ballot as the nominee for the same office of two parties. An act of 1891 was repealed making it unlawful for any person to sell or give fire-arms or ammunition to any half breeds or Indians who had not renounced their tribal relations. The office of food and dairy commissioner was established and it was made the duty of the commissioner to enforce all existing pure food laws, to regulate the manufacture and sale of all products of the dairy, to encourage the organization of creameries and cheese factories by disseminating information as to the best market for their products and by similar means. In the same connection one of the most interesting and probably the most sweeping of all acts for the prevention of trade in oleomargarine was passed. (See article OLEOMARGARINE.) This act directed that every place where oleomargarine was sold at wholesale or retail, including boarding houses and hotels and lunch rooms, should be decorated by a white placard at least 10 x 14 inches in size and put in a conspicuous place, and on this placard should be printed in black letters 1½ inches square the words, "Oleomargarine sold here," and no other words. An act of 1895 permitting counties and townships to provide seed grain for those whose crops the year before had been destroyed, was repealed. The use of the United States flag for advertising purposes was prohibited. The penalty for kidnapping was made imprisonment for life or for a minimum of ten years. For the establishment of school libraries a tax was directed to be levied of 10 per cent. per capita for each child of school age, and at the same time it was directed that in cities of the first and second class a tax of 2 mills might be levied for the purchase of books, and a tax of 3 mills for the construction of library buildings. The requirements for the admission of candidates to practice medicine were increased by requiring them either to pass a sufficient examination or to be graduates from a medical college having a four-years' course. Applicants for the practice of dentistry were directed to present a diploma from a reputable dental college or to pass examinations, and to show at the same time that they had studied or been engaged in the practice of dentistry for at least three years. Congress was petitioned to pass the bill pending in the United States Senate providing for the establishment of schools of mines in every State. It was stated that such schools would be of incalculable value to the development of the mineral and geologic interests of the State.

Congress was also petitioned under article V. of the constitution to call a convention to propose an amendment for the direct election of United States Senators.

River Drainage.—Petitions were addressed to Congress by the legislature asking for a federal appropriation of money to prevent the present flooding of lands in South Dakota by the Missouri and James Rivers. It was stated that large tracts of the most fertile lands of the State situated along the Missouri river and in Yankton, Clay, and Union counties were frequently flooded during the spring freshets, preventing the use of lands bordering the river for the entire season, causing a large loss to residents, and materially reducing county and State taxes. With reference to the James river, emptying into the Missouri near Yankton, it was stated that this river had a slight descent and a sluggish current and that on this account the waters from the melting of the deep snows frequently inundated the valley lands for several hundred miles from the mouth of the stream, and that this inundation was increased by the bar which had been thrown up by the shifting currents of the Missouri across the mouth of the Dakota, thus preventing the water from flowing down. For the removal of this bar and for the improvement of the channel of the Missouri, Congress was petitioned for aid.

Elections.—On January 22 the legislature elected Robert J. Gamble (Rep.) as United States Senator for the full term ending March 4, 1907. Mr. Gamble succeeded Richard F. Pettigrew (Silverite), and was chosen without opposition by the Republican caucus. The vote in the legislature was as follows: In the Senate: Robert J. Gamble, 38; Richard F. Pettigrew, 5; not voting, 2. In the House: Robert J. Gamble, 75; Richard F. Pettigrew, 8; not voting, 4. On July 11 the governor appointed Alfred B. Kittridge (Rep.) to fill the vacancy caused by the death on July 1 of James H. Kyle (*q.v.*) (Rep.), whose term would have expired March 4, 1903.

State Officers.—Governor, Charles N. Herreid; lieutenant-governor, George W. Snow; secretary of state, O. C. Berg; treasurer, John Schamber; auditor, James D. Reeves; attorney-general, John L. Pyle; superintendent of public instruction, E. E. Collins; commissioner of public land, David Eastman. Supreme Court: Justices—H. G. Fuller (presiding judge in 1901), Dick Haney (presiding judge in 1902), and Dighton Corson—all Republicans.

Congressional Representatives (57th Congress).—In the House—Charles H. Burke, from Pierre, Republican, elected at large; and Eben W. Martin, from Deadwood, Republican, elected at large. In the Senate—A. B. Kittridge (until 1903), from Sioux Falls, appointed by the governor vice James H. Kyle, who died July 1, 1901; and Robert J. Gamble (until 1907), from Yankton—both Republicans.

SOUTH, UNIVERSITY OF THE, a prominent Protestant Episcopal institution at Sewanee, Tenn., established in 1868. The university in 1900-01 had 54 instructors and 537 students, distributed as follows: theological, 26; medical, 227; law, 17; academic, 122; grammar school, 154. The library contains 21,391 bound volumes, and will soon move into a new building, especially erected for it. The Quintard Memorial Hall, for the grammar school, was completed and furnished in 1901 by Mr. J. Pierpont Morgan. The erection of a gymnasium has been started through the generosity of Mr. John D. Shaffer, and additional gifts from the alumni.

SPAIN, a kingdom of southwestern Europe, occupies the greater part of the Iberian peninsula and has an area of 197,670 square miles. According to the census of 1897 the population was 18,089,500; in 1900 it was estimated at 18,800,000. The largest cities are the capital, Madrid, with a population in 1897 of 512,158; Barcelona, 529,589; Valencia, 204,768; and Seville, 146,205.

Government, Defense, and Finance.—Spain is a constitutional monarchy with the executive power exercised by the king through a council of ministers, and the legislative power vested in the king and the *Cortés*. The *Cortés* is composed of a senate of 360 members, partly hereditary and appointive, and partly elected, and a chamber of deputies, consisting of 431 members, elected by universal suffrage. The Liberal ministry in office at the end of 1901 was constituted as follows: Premier, Sagasta; finance, Urzaiz; foreign affairs, Duke of Almodovar; interior, Morel; justice, Marquis de Teverga; instruction, Count Romano; public works, Villanuova; war, General Weyler; navy, Duke of Veragua. Revenue is derived from direct and indirect taxation, the public domains, the tobacco monopoly, the state lottery, and the mint. The chief items of expenditure are the interest on the public debt, the army and the navy. The estimated revenue for the year 1900-01, as corrected, was 934,428,311 pesetas (peseta equals 19.3 cents); and the expenditure, 926,498,150 pesetas; for 1901-02 the provisional estimates were: Revenue, 936,006,165 pesetas, and expenditure 905,413,083 pesetas. On July 1, 1900, the national debt amounted to 9,188,830,792 pesetas.

Production, Industry, and Commerce.—In 1900 the wheat crop was estimated at 108,958,940 bushels, an increase of more than 8,000,000 bushels over 1899; and the rye crop at 19,087,771, a decline of nearly 2,000,000 bushels from the crop of the preceding year. In 1899-1900 there were 32,215 tons of cane sugar produced and 50,246

tons of beet sugar. In 1900-01 the output of both kinds was estimated at 150,000 tons. The country is exceedingly rich in minerals, containing iron, coal, copper, silver, lead, quicksilver, zinc, and sulphur. In 1899 the value of the mineral products was placed at 167,154,440 pesetas; in 1900 it increased to 189,137,560 pesetas. The value of the copper was over 46,000,000 pesetas; iron, 38,000,000; silver, 34,376,407; and lead, 27,248,190. The mining industry is developing rapidly and is attracting foreign capital in considerable quantities. During the last few years a German mining syndicate has been opening up valuable iron mines in Lugo province. In 1900 a railway line, seventy miles in length, was completed from Urillas to Saragossa. The former place is situated in the heart of the coal region, and the establishment of communications with the large cities is bound to encourage the growth of coal mining. The foreign commerce in 1900 showed a decline from that of the previous year; imports fell from 954,156,701 to 862,396,600 pesetas and exports from 768,207,934 to 723,867,883 pesetas (the figures are provisional and subject to revision). The chief articles of import in the order of their importance are food-stuffs, sugar and wine, raw cotton and cotton manufactures, machinery, minerals and glassware, animals, drugs and chemical products, and manufactures of silk, wool, and paper. The principal commodities exported are grain, sugar, wine, minerals, metals, animal products, and timber. Since the war with the United States an increased spirit of commercial activity has become prominent. To gain new markets in place of those lost in the West Indies and the Philippines, Spanish merchants have turned to the Latin states of South America, which on their side have shown no reluctance to enter into closer relations with the mother country. Closer relations between Spain and the South American republics were established by the Ibero-American Congress which assembled at Madrid on November 10, 1900. The question of commercial treaties between the several countries was discussed at great length and some steps were taken towards the formation of a Spanish-American bank. At home an attempt was made to encourage commerce as well as manufactures by the creation of so-called "free zones" around the great seaports, especially around Barcelona. Within the "free zone" foreign manufactures might be brought in free of duty and stored for exportation, while raw materials might be imported, worked into manufactures, and shipped again, without charge. The idea of the "free zones" was earnestly advocated by the Fomento del Trabajo Nacional (Society for the Encouragement of National Industries). In 1898 the merchant navy included 436 steamers, and 1,145 sailing vessels, with a tonnage of 506,465. In 1899 there were 8,068 miles of railway, with 110 miles under construction. Subsidies amounting to \$64,000,000 have been granted by the government to the railway companies. In 1898 there were 19,868 miles of telegraph and 6,250 miles of telephone.

HISTORY.

The Cabinet.—When the Azcarraga ministry came into power late in 1900 it was evident from the first that it could not retain office for a long time; but that it was simply to act as a makeshift until parties could be arranged on some more permanent basis. The position of the ministry was made difficult by the spirit of discontent which prevailed throughout the country. The Carlists were active in many districts and seemed likely to break out into open rebellion; the unhappy economic condition of the country showed itself in strikes and labor riots, leading to the suspension of constitutional government in many places; above all there was general dissatisfaction with the approaching marriage of the Princess of the Asturias to Don Carlos of Bourbon. The Liberals indeed could have regained office much earlier than they did, were it not for the fact that they did not desire to be in power during the marriage of the princess, and to incur the odium attached to the event. They preferred rather to wait until within a short time of the king's attaining his majority so as to be at the helm when a new policy might be inaugurated. On February 26 the Azcarraga ministry resigned. Attempts were made by Silvela, Villaverde, and Azcarraga himself to construct a new conservative cabinet; but the task was found impossible and the queen regent turned to the veteran Liberal, Sagasta, who organized a ministry. The chambers were dissolved and the new ministry went before the country; but as the government in Spain practically controls elections, there was no doubt of the result. The strength of the Liberals in the new chamber was about 230, as opposed to 63, made up of no less than eight or nine factions. In the Senate the Liberal majority was not so preponderant, the government numbering about 163, the Conservatives 112, and various smaller parties about 75, so that by a coalition the ministry might be defeated in the upper house.

The new *Cortés* was opened on June 11, 1901, and the stereotyped programme of far-reaching and unattainable reforms was brought forward by the ministry. The cabinet proposed to deal with the problem of electoral and municipal reform in such a manner as to insure a greater amount of local self-government and thus to forestall demands for complete autonomy made by the Regionalists or Separatists throughout Spain. The question of arbitration was also to receive considerable attention. The

army was to be reorganized and the creation of a new navy made one of the chief subjects for action in the immediate future. A system of tribunals of arbitration was to be organized and a bill on religious orders, similar in nature to that mooted in France to be introduced. Minor reforms were to be initiated in the ministries of public works and institutions. Some of the promises made by the government were redeemed in the latter part of 1901. On October 12, a measure was introduced by the ministry dealing with the reorganization of the jury system; on October 28, another bill was proposed, making education obligatory on all children between the ages of 6 and 12; on the following day a measure was introduced dealing with the question of strikes and courts of arbitration. By the end of the year, however, no definite action had as yet been taken on any of the proposed measures, and it became evident that the Sagasta ministry, like its predecessors, was too much hampered by the complicated situation of political affairs and the clash of multifarious personal interests to effect any real reforms in the immediate future. The position of the ministry grew notably weak. In the municipal elections which took place early in November, important gains were made by the Republicans and Socialists at the expense of the two constitutional parties.

Public Tumult.—A number of causes united to produce great public disorder during the year. One of the chief grounds of discontent throughout the country was the marriage of the Princess of the Asturias to Don Carlos of Bourbon, which occurred at Madrid on February 14. The majority of the nation regarded with considerable uneasiness an alliance between the heiress presumptive to the throne, and the son of one of the most notorious adherents of reactionary principles, as threatening the possible restoration of absolutist ideas and clerical supremacy in the government. The arrival of the Count of Caserta, the father of the royal bridegroom and formerly one of the most active partisans of Don Carlos, was the occasion of rioting at Madrid, accompanied by violence to the person of the Count, and leading to the establishment of martial law. Similar demonstrations occurred at Valencia, Granada, Barcelona, and Santander. Mingled with the spirit of resentment against the royal alliance there was a feeling of bitter hostility against the clerical element, and especially against the Jesuits. In fact, in most cases the opposition to threatening Carlism and the Jesuits came from the same classes. At Madrid a *cause célèbre* was made the occasion of violent demonstrations against the clerics. A certain Señorita Uboa, the member of a wealthy family, who was just about to attain her majority and to come into possession of a large fortune, suddenly entered a convent with the expressed intention of adopting a monastic life. The relatives of the lady declared, and their charges were practically substantiated, that she had been influenced in her action by her Jesuit confessor, who was desirous of obtaining the lady's wealth for the church. The case was carried to the courts; the lawyers for the Uboa family succeeded in giving to the case the air of a struggle between personal liberty and ecclesiastical tyranny, and became in consequence the heroes of the populace. The Supreme Court at Madrid ordered the release of Señorita Uboa, and the event was received with manifestations of riotous, and slightly theatrical, rejoicing. In April, the production of an anti-clerical play, *Electra*, by the celebrated writer, Galdos, was made the occasion of renewed demonstrations at Madrid, Bejar, and Salamanca. In Barcelona, there was a third element of disorder besides that of opposition to the royal marriage and the clergy. This was the intense feeling of local independence, in the cause of which Catalonia is so ardent a champion. At a mass meeting at Barcelona on March 31, a demand was made for the separation of church and state, the suppression of the religious congregations, and the confiscation of their property, and though no open advocacy of separatist principles was made, it was an undoubted fact that the partisans of decentralization were simply making use of the general outcry against the clerical powers to further their own purposes. On May 8, there was a conflict between the populace and the military in the streets of Barcelona. Two days later more than 10,000 troops were concentrated within the city.

SPANISH LITERATURE. *History and Biography.*—The zeal and industry which Spanish writers habitually bring to the study of their own history bear abundant fruit this year in an interesting group of monographs ranging from pre-historic times down to the present day. First in point of time is an important volume by Señor Dorado upon *Penal Law in Iberia*, which the author defines as "a contribution to the study of the primitive history of Spain," and which deals with hitherto little known customs of Celtiberian tribes. The Marquis of Monsalud, a distinguished archæologist and a recently elected member of the Academy of History, devoted his discourse on the occasion of his reception, to *Roman and Visigothic Architecture of Estremadura*. Señor Arenas is author of a curious little monograph written with the patriotic object of proving that the ancient hero, Viriathus, was not a Portuguese but a Celtiberian. History proper has been enriched by new volumes in several important series; the second part of Catalina Garcia's *Castile and Leon During the*

Reigns of Pedro I., Henry II., John I., and Henry III., one of the most valuable contributions to the mediæval annals of Spain; the eleventh volume of General Gómez Arteche's *War of Independence*; and vols. VI. and VII. of Señor Fernandez Duro's monumental history of the Spanish navy, *Armada Española desde la union de los reinos de Castilla y de Aragon*. The early history of Spain's colonies never before engrossed the attention of Spanish writers to such an extent as since she has been obliged to part with most of them. Among new volumes, one of special importance is *The Geographical Services of the Casa de Contratacion*, an organization founded in Seville in 1503 to aid the newly discovered American territories. In compiling this volume, Señor Puente y Olea has for the first time given a detailed account of the expeditions organized or aided by the Casa, from that of Juan de la Cosa to that of Magellan. The Spanish colonies in the Gulf of Guinea serve Señor Ferrer with a subject for a voluminous work entitled *Fernando Po and Its Dependencies*.

Local and provincial history continues to receive its customary share of attention. Under this head must be mentioned such volumes as the opening instalment of Señor Carreras's *Historical Notes on Sarria*; the third part of Señor Lopez Ferreiro's *History of the Famous Cathedral of Santiago de Compostela*; and the first volume of Señor Arigita's *Collection of Unpublished Documents Relating to the History of Navarre*. Finally a monograph upon the history of a distinctly national institution, the bull-fight, has been prepared by Count de las Navas, under the title *El Espectaculo más nacional*.

Biography is not a striking feature in the publications of 1901. There are, however, one or two volumes devoted to Señor Canovas del Castillo, which deserve to be chronicled, such as those by A. Fons y Umbert, and A. de Lara y Fedrajas; and one contribution to the memory of Castelar, *El Juventud de Castelar*, by Señor Morayta.

Belles Lettres.—The publication of important literary studies and critical editions of the Spanish classics has formed a prominent feature of the literary productions of the last few years. The admirable new edition of the *Obras de Lope de Vega*, under the editorship of Menéndez y Pelayo, has reached its eleventh volume; and critical texts of the *Disputa de la Alma y del Cuerpo*, and of the *Auto de los Reyes Magos* have been supervised by Señor Menéndez Pidal. The annual crop of monographs upon Cervantes includes no less than two devoted to the *Novelas Ejemplares*, written respectively by Señor Icaza and Señor Aprais; while the question whether Cervantes studied at Seville or not forms the thesis of an essay by Rodriguez Marin. Finally, Señor Menéndez y Pelayo has published a third series of his collected essays; Señor Cotarelo y Mori has to his credit a volume of *Estudios de historia literaria en España*, and Don Eugenio Hartzenbusch has compiled a bibliography of the works of his famous father.

Fiction.—The year has brought forth little of real note in the shape of novels. Galdos still continues his *Episodios Nacionales* with unabated prolificness, but his most notable achievement was in another field—his play, *Electra*, which proved to be the leading literary event of the year. The central theme of this play is a religious one, and not especially new, since he had already voiced much the same views in his *Doña Perfecta* and other familiar novels. But it happened to catch the popular fancy, and was eagerly seized upon by the Liberal party as a strong weapon in their fight against the present religious reaction in Spain. Fiction and criticism have both suffered a serious loss in the death of Leopoldo Alas; the event, however, resulted in bringing into prominence a new edition of Alas's principal novel, *La Regenta*, which, in the opinion of some critics, comes very near to being the best Spanish novel of the nineteenth century. Emilia Pardo Bazán is represented only by a volume of short stories, *En Tranvía*. Vicente Blasco has published another story of Valencian manners, *Entre Naranjas*, written in his customary attractive style. Other volumes of new fiction include *La Goletera*, by Arturo Reyes; *La Casa de Aizgerri*, by Pio Baroja; *Lully Arjona*, by Señor Danvila, and *El Ultimo patriota*, by Nogales.

SPECIES. See BIOLOGY.

SPEEDWAYS FOR PACERS AND TROTTERS. Amateur driving of trotters and pacers for pleasure in speeding contests had been made next to impossible, in the neighborhood of large cities, by the extension of suburban trolley cars, when the city of New York gave new life to the sport by building the Riverside Speedway. The movement found instant favor elsewhere, and the year 1901 saw municipal speedways built and legislatively restricted to trotters and pacers, in many cities, among which are Buffalo, Cleveland, Detroit, Philadelphia, Toledo, Milwaukee, Boston, and New York (in the borough of Brooklyn and at New Brighton, in the borough of Richmond). Regular amateur trotting and pacing contests were held in 72 of the principal cities in 1901, in which over 1,600 horses and drivers took part. Cresceus trotted a mile against time at Columbus, O., August 2, 1901, in 2m. 2¼s., and Prince Alert paced two heats at Memphis, Tenn., October 21, 1901, in 2m. 0¾s. and 2m. 2½s. respectively.

SPORTS. See the articles on the various sports.

SPRAGUE, HORATIO J., United States consul at Gibraltar, died there, July 18, 1901. He was the son of Horatio Sprague, former consul at Gibraltar, and was born there August 12, 1823. Upon the death of his father in 1848, Mr. Sprague was appointed to succeed him by President Polk, and he retained the post from that time until his death, being for some time the oldest member of the consular service.

STAINER, Sir JOHN. English organist and composer, died at Verona, Italy, March 31, 1901. He was born in London, June 6, 1840, and while a chorister at St. Paul's (1847-56), studied music under Bayley, Steggall, and Cooper. In 1859 he entered Christ Church, Oxford, and graduated in music the same year, in arts in 1865, and as musical doctor in 1865, being also organist of Magdalen College, and from 1860 organist to the university. He held many high offices as a musician. He was principal of the Royal College of Music from 1883, and professor of music at Oxford, from 1889, and from 1872 to 1888 he was prominent as organist of St. Paul's. As a composer he produced many oratorios, church-services, cantatas, and anthems, among them *Gideon* (oratorio); *The Daughter of Jairus* (1878), and *St. Mary Magdalene* (1883), cantatas; and wrote primers on the organ, harmony, etc.; *Treatise on Harmony*; and *Dictionary of Musical Terms* (1876), with W. A. Barrett. He was made chevalier of the Legion of Honor in 1878, and was knighted by Victoria in 1888.

STANDARD TIME. See ASTRONOMICAL PROGRESS.

STANFORD UNIVERSITY. See LELAND STANFORD, JUNIOR, UNIVERSITY.

STARS. For the new star in Perseus, the distance of faint stars, the stereo-comparator, and the velocity of Alpha Persei, see ASTRONOMICAL PROGRESS.

STATE BANKS. The figures from which the table on the following page is prepared were taken from the reports of State banks made to the comptroller of the currency at slightly different times; but approximating to June 30, 1900, and June 30, 1901. In a few cases the reports were unofficial, and in a few others they include both State banks and private banks.

STEEL. See IRON AND STEEL.

STEIN, ROBERT. Arctic explorer, returned to the United States in 1901, after a two-years' exploration of Ellesmereland. He was born at Rengersdorf, Prussia, in 1857, and after receiving a classical education at Glatz, he came to the United States in 1883 and studied medicine at Georgetown University. In 1885 he entered the United States Geological Survey, becoming translator of the German, French, Italian, Danish, Swedish, and other languages. His plan for the exploration of Ellesmereland, published in 1893, attracted attention, but was not carried out; in 1897 he joined the seventh Peary expedition to Western Greenland to explore and map its coast. In 1899, with two companions, he went to Ellesmereland, his plan of exploration differing from that first published; after spending a year in research and mapping work he crossed Baffin's Bay to western Greenland, returning from that region in the *Windward*. He has published numerous magazine articles on Arctic exploration. See ARCTIC EXPLORATION.

STEINMETZ, CHARLES PROTEUS, electrical engineer and physicist, was elected president of the American Institute of Electrical Engineers in 1901. He was born at Breslau, Prussia, April 9, 1865, and was educated at the gymnasium and university of that city. Afterward he became an instructor in mathematics at Breslau and subsequently at Berlin, at the same time studying in physics and chemistry. At the Polytechnicum at Zurich he studied mechanical engineering, and after a brief period spent in France came to America in 1889. His thorough mathematical and general scientific training soon enabled him to make great progress in the design and construction of electrical apparatus, and he became one of the leading authorities in America on alternating currents and their underlying mathematical theory. In 1893 he became connected with the General Electric Company, and is now at their Schenectady works. He has delivered courses of lectures in electrical engineering at Columbia University, and has published many scientific papers in the *Zeitschrift für Mathematik und Physik*, *American Journal of Mathematics*, and the *Proceedings of the American Institute of Electrical Engineers*. His best known works are *Theory and Calculation of Alternating Current Phenomena*, *On the Law of Hysteresis*, and *Theoretical Elements of Electrical Engineering*.

STEPHAN, JOSEPH A., Roman Catholic dignitary, died in Washington, D. C., September 12, 1901. He was born in Baden, Germany, in 1822, and was educated at Karlsruhe and Freiburg, completing his theological studies at Cincinnati, O. During the Civil War he served as a chaplain in the Union army, and in 1884 he was made Director of Catholic Indian Missions at Washington, which post he occupied at the time of his death. At the celebration of his golden jubilee in the priesthood in 1899, he was raised to the dignity of Prothonotary Apostolic. Father Stephan was also a private chamberlain to the Pope, with the title of Monsignor.

STATE BANKS.

STATES, ETC.	NUMBER OF BANKS.		TOTAL RESOURCES.		DEPOSITS.	
	1900.	1901.	1900.	1901.	1900.	1901.
New Hampshire.....	9	10	\$ 1,859,849	\$ 2,081,649	\$ 989,536	\$ 972,007
Rhode Island.....	4	4	1,397,875	1,394,536	730,580	708,344
Connecticut.....	8	8	10,504,875	11,180,075	7,145,744	7,840,230
Total N. England States	21	22	\$ 13,762,599	\$ 14,656,260	\$ 8,855,860	\$ 9,520,561
New York.....	200	198	\$ 365,888,986	\$ 468,488,387	\$ 251,059,315	\$ 359,735,580
New Jersey.....	20	20	11,730,508	12,628,514	8,144,081	8,633,674
Pennsylvania.....	95	103	91,694,739	110,940,890	73,345,813	91,202,082
Delaware.....	2	3	2,989,643	2,515,080	1,685,303	1,407,066
Maryland.....	26	28	9,932,687	9,560,674	7,106,607	7,282,801
Total Eastern States	343	352	\$ 482,186,472	\$ 604,123,525	\$ 341,341,068	\$ 468,241,193
Virginia.....	95	111	\$ 33,313,585	\$ 37,376,018	\$ 22,451,581	\$ 25,491,027
West Virginia.....	83	101	24,713,283	33,945,366	18,999,142	26,225,147
North Carolina.....	54	79	10,102,386	12,489,857	6,345,312	7,707,702
South Carolina.....	27	31	5,545,443	5,195,956	3,263,144	2,433,760
Georgia.....	144	169	38,929,686	44,118,207	23,009,084	23,585,161
Florida.....	23	20	4,643,618	4,582,545	3,489,436	3,639,306
Alabama.....	20	22	7,129,164	4,383,944	4,588,607	2,568,673
Mississippi.....	101	117	19,345,841	23,984,412	12,547,108	13,677,775
Louisiana.....	56	66	18,137,832	26,768,608	12,683,338	18,940,541
Arkansas.....	39	44	6,604,264	8,202,126	4,464,013	5,564,287
Kentucky.....	219	237	48,849,339	52,085,702	32,296,874	35,636,788
Tennessee.....	56	132	11,137,312	23,986,041	7,308,710	15,983,268
Total Southern States	917	1,129	\$ 228,451,653	\$ 276,998,282	\$ 150,440,319	\$ 181,453,519
Ohio.....	164	198	\$ 105,829,130	\$ 146,663,551	\$ 85,187,634	\$ 119,744,444
Indiana.....	96	106	22,576,934	25,644,273	16,798,432	19,652,018
Illinois.....	155	161	216,880,115	258,897,816	169,208,991	197,437,869
Michigan.....	194	207	124,890,305	145,036,939	102,448,659	120,201,802
Wisconsin.....	137	151	54,719,436	60,345,626	45,929,235	51,051,755
Minnesota.....	188	208	38,685,212	45,087,990	28,130,788	29,737,551
Iowa.....	214	218	45,118,298	53,893,613	32,936,940	41,153,346
Missouri.....	510	588	113,802,416	129,861,180	80,563,206	96,674,440
Total Middle States	1,658	1,837	\$ 722,431,845	\$ 863,400,968	\$ 561,170,634	\$ 675,703,279
North Dakota.....	129	188	\$ 8,255,567	\$ 7,728,224	\$ 5,741,792	\$ 5,271,435
South Dakota.....	109	195	7,142,357	14,938,203	6,322,864	11,303,286
Nebraska.....	405	421	34,529,286	40,063,126	26,266,085	30,564,684
Kansas.....	384	410	38,352,572	47,687,865	28,491,889	37,097,402
Montana.....	15	18	8,866,269	13,353,791	6,066,087	10,582,877
Wyoming.....	9	10	620,173	944,181	637,381	681,466
Colorado.....	30	31	9,685,023	11,126,289	8,186,722	9,396,677
New Mexico.....	6	10	2,125,408	1,744,724	1,686,996	1,353,868
Oklahoma.....	71	113	4,520,055	7,437,181	3,542,224	6,039,297
Total Western States	1,158	1,341	\$ 114,056,712	\$ 145,004,583	\$ 84,873,480	\$ 112,289,137
Washington.....	27	31	\$ 9,533,859	\$ 11,789,610	\$ 7,308,687	\$ 9,859,442
Oregon.....	19	21	4,506,182	3,865,446	3,301,580	2,809,643
California.....	178	180	146,496,782	163,969,951	86,881,584	98,848,187
Idaho.....	8	10	781,466	1,162,197	587,903	804,438
Utah.....	20	28	29,643,138	38,927,736	17,434,061	25,189,338
Nevada.....	4	3	2,071,664	2,255,697	1,474,357	1,619,094
Arizona.....	14	16	2,762,474	3,918,806	2,296,906	3,233,496
Total Pacific States	270	289	\$ 195,793,764	\$ 225,929,443	\$ 118,285,049	\$ 142,313,638
Hawaii.....	2	2	\$ 3,152,757	\$ 2,946,078	\$ 1,818,672	\$ 1,705,551
Porto Rico.....	.....	3	.....	3,364,042	.....	1,753,782
Philippines.....	.....	7	.....	24,553,079	.....	17,623,592
Total Islands	2	13	.....	\$ 30,863,190	.....	\$ 20,980,925
Total United States	4,389	4,983	\$1,759,835,802	\$2,180,976,280	\$1,266,735,282	\$1,610,502,246

STEPHENS, JAMES, Fenian agitator, died at Dublin, March 29, 1901. He was born at Kilkenny in 1824, and early became active in the cause of Irish independence. After the insurrection of 1848, in which he was wounded, he fled to the Continent and spent some years there, chiefly at Paris, familiarizing himself with the inner

workings of secret political societies. He returned to Ireland in 1856 and traveled quietly throughout the country, investigating conditions and inciting his countrymen to readiness for open revolt at the favorable opportunity. A like work was being done among the Irishmen in the United States by a colleague, O'Mahony, the plan being to secure the money and arms from them, and the soldiers from Ireland. Stephens, as "head-centre" of the movement, organized the scheme of government for the prospective "Irish Republic," founded its official organ, *The Irish People*, at Dublin in 1863, and oversaw generally the progress of the conspiracy that was to burst into revolt on September 20, 1865 (the anniversary of Robert Emmet's execution), and mark the destruction of English oppression. The authorities learned the plans, however, seized the office of *The Irish People* on September 15 and threw into jail the principal conspirators, with the exception of Stephens, who remained in hiding for two months. When finally arrested he escaped from prison before his trial and eventually came to America, where he tried in vain to reconcile the two divisions of his followers. He was denounced and deposed from leadership, and to preserve his life fled to Paris. In 1891 he returned unnoticed to Dublin and lived the remainder of his life apart from political strife.

STEREO-COMPARATOR. See ASTRONOMICAL PROGRESS.

STERNE, SIMON, American lawyer and economist, died in New York City, September 22, 1901. He was born in Philadelphia, July 23, 1839, and was educated at Heidelberg, and at the University of Pennsylvania, graduating in law in 1859. In 1861 he went to New York City, where he made a special study of railway law and became a Cooper Union lecturer on political economy (1863-65). Mr. Sterne was one of the organizers and secretary of the American Free Trade League in 1864, and in 1863-64 he was editor of the *New York Commercial Advertiser*, leaving that post to establish in 1865 *The Social Science Review*. As a member and secretary of the Committee of Seventy, in 1870, he did valuable work in overthrowing the notorious Tweed Ring. He served on various commissions—for the revision of railway legislation, to devise a plan for city government in New York, to study railways in Europe, etc. He published, among other works, *Representative Government* (1871), *Development of the Political and Constitutional History of the United States* (1882), and articles on American cities, legislation, railways, monopolies, and representation in *Lalor's Cyclopædia*.

STEWART, Sir WILLIAM HOUSTON, British admiral (retired), died in London, November 13, 1901. He was born in Ayrshire, September 7, 1823, and entered the Royal navy in 1835. As a midshipman he first saw service during the Carlist War of 1836-37 in Spain, then in the Syrian War of 1840, in the Baltic, during the Crimean War of 1854, and was wounded at the bombardment of Sebastopol. From 1863 to 1868 he acted as captain-superintendent of the Chatham dockyards. Attaining the rank of rear-admiral in 1870, he filled various posts as dockyard superintendent until 1881, when he was made comptroller of the navy and given the rank of admiral. In the same year he was made commander-in-chief at Devonport, a post which he held until a short time before his retirement in 1885.

STILLMAN, WILLIAM JAMES, American painter, journalist, and critic, died in Surrey, England, July 6, 1901. He was born in Schenectady, N. Y., June 1, 1828, and graduated at Union College in 1848. Two years later he went to England to study art, and became imbued with the spirit of Rossetti and Millais, which gained him the title of "the American pre-Raphaelite." In 1852, having been inspired by Kossuth's visit to America to assist in achieving Hungarian independence, he undertook a secret mission to Hungary for the revolutionists, which, however, failed, and Stillman fled to Paris. There he resumed his art study and became associated with Millet and Rousseau, leaders of the Barbizon School. Returning to the United States he founded (1855) *The Crayon*, a magazine devoted to art criticism, which was abandoned two years later as a financial failure. For a time he lived at Cambridge, Mass., where he was on intimate terms with Lowell, Longfellow, Agassiz, and others of the Boston literary set, whose quiet life contrasted sharply with his own restless characteristics. Tiring of this he removed again to London and plunged enthusiastically into painting, this time taking Ruskin as mentor. He passed a summer with him in Switzerland, drawing and sketching under his direction, until obliged by failing eyesight to give up art. Upon the outbreak of the Civil War he returned to the United States with the intention of entering the Union army. He was rejected, however, but in 1861 received the appointment of United States consul at Rome, where he served until transferred to a like post in Crete in 1865. During the Cretan insurrection of 1868, overt Mussulman hostility and threats on his life forced him to relinquish his post, whereupon he again settled in London. Literary work engaged him there until 1875, when the outbreak of the insurrection in Herzegovina secured him the appointment as a special correspondent of the *London Times*. As corre-

spondent for the *Times* in Italy and Greece during the succeeding twenty-two years, Mr. Stillman traveled extensively, at the same time writing voluminously and with rare intelligence on widely diversified subjects, and wielded an influence such as is rarely won by a man in his position. The columns of practically every English and American newspaper and periodical were open to him; for he was recognized as an absolutely fearless and unprejudiced critic on whatever subject he treated, in art, politics, or history. In his painting Mr. Stillman specialized in landscapes and exhibited at the National Academy of Design in New York City from 1851 to 1859, his best known work being "The Procession of the Pines" (1858). He published many books at various times, among which are *History of the Cretan Insurrection* (1874); *On the Track of Ulysses*, containing accounts of his archæological explorations (1888); *Early Italian Painters*; *The Union of Italy*; *Apollo and Venus*; and *The Autobiography of a Journalist* (1901).

STOILOFF, CONSTANTIN, former premier of Bulgaria, died at Sofia, April 6, 1901. He was born at Philippopolis, Bulgaria, in 1853, and was educated at the Roberts College, the American institution near Therapia on the Bosphorus, in Paris, and at the University of Heidelberg. From 1879 to 1899 he was active in Bulgarian politics, being minister of justice for five years prior to 1888, in the Stambuloff cabinet. After the fall of the Stambuloff party, he became (1894) premier of the new cabinet, and in 1896 took charge of the foreign office. Before his resignation in 1899, M. Stoiloff had become one of the best known, and, perhaps, the ablest of Bulgarian statesmen.

STORAGE BATTERY, EDISON. Announcement was made in May, 1901, of a storage battery invented by Thomas A. Edison, in which the storage energy per unit mass was greatly increased over other forms of storage batteries. To understand the significance of this invention a comparison between it and the ordinary commercial battery is necessary, and this comparison can best be made, perhaps, in the words of Professor Arthur E. Kennelly, who discussed the new Edison battery in a paper before the American Institute of Electrical Engineers. "It is well known that the history of the storage cell is essentially that of the lead cell discovered by Planté in 1860, in which lead peroxide is the depolarizing substance. An enormous amount of labor has, in the aggregate, been expended upon the improvement of this cell in the hands of experimentalists. As a result of that labor, the storage battery has at last become a recognized adjunct to direct-current central stations, but it has limitations that seem to withstand further attempts toward improvement. Of recent years, hardly any success has been met with in the direction of reducing its weight for a given energy-storage capacity, without detriment to endurance, and this weight is the great drawback of the storage battery in electric storage traction, and has been the principal obstacle to its advance in this direction for the past twenty years. In practice, the storage energy per unit mass of the modern lead battery, is from four to six watt-hours per pound of battery (8.8 to 13.23 watt-hours per kilogramme). Expressed in another way, a battery weighs from 124.5 to 186.5 pounds per horse-power-hour at its terminals (75.5 to 113.4 kilos per kilowatt-hour); or, if its stored energy available at terminals were all expended in gravitational work, a battery could raise its own weight through a vertical distance of from two to three miles (3.2 to 4.8 kilometres)."

In the cell the negative pole, or positive element, corresponding to the zinc of a primary cell, or the spongy lead of a secondary cell, is iron. The positive pole or negative element, corresponding to the carbon of a primary cell, or lead peroxide of a secondary cell, is a superoxide of nickel believed to have the formula NiO_2 . The cell is, therefore, a nickel-iron cell. The electrolyte is potash; that is, an aqueous solution containing from 10 to 40 per cent. by weight, but preferably 20 per cent. of potassium hydroxide, the freezing temperature being 20°F . below zero. The storage capacity of the cell per unit of total mass is 14 watt-hours per pound. Expressing the same statement in another way, the weight of battery per unit of electrical energy at terminals is 53.3 pounds per horse-power per hour, or 32.4 kilos per kilowatt hour. Upon the announcement of these results the public press made extravagant claims that the new battery was certain to revolutionize storage-battery work in a very short time. The best authorities, however, are not universally agreed that these anticipations will be realized, and up to the end of the year the new battery had made very little commercial progress.

STRAITS SETTLEMENTS, a British crown colony on the Straits of Malacca, from which it derives its name, includes the settlement of Malacca and Wellesley on the mainland of the southern portion of the Malay peninsula, the adjacent islands of Singapore, Penang, and the Dindings, together with the Keeling group and Christmas Island (*q.v.*) in the Indian Ocean. The estimated area of the colony is 1,542 square miles, and the population (1901) 572,249. The inhabitants are chiefly Malays and Chinese. The town of Singapore, with 162,547 inhabitants, is the seat of government. On the mainland of the Malay peninsula, connected with the colony

territorially, are the Federated Malay States (*q.v.*), over which the governor of the Straits Settlements has supervisory control under the title of high commissioner, and Johore (*q.v.*), an independent Malay state, the foreign relations of which are in the hands of the British government. The colony is administered by a governor, who is assisted by an executive and a legislative council.

The importance of the Straits Settlements commercially has greatly increased in the past few years, and it is now considered one of the most valuable of the British crown colonies. The revenue increased from 5,200,025 dollars (Mexican = 46.4 cents October 1, 1901) in 1899, to 5,386,557 dollars in 1900, and the expenditure from 5,060,614 dollars in 1899, to 6,030,744 dollars in 1900. There is no public debt. The chief sources of revenue are licenses, 3,317,753 dollars in 1899, stamp taxes, port and harbor dues, and land revenue. The ports are free and there is no customs revenue. Singapore is one of the most important shipping centres in the world, and three-fifths of the whole trade of the colony passes through its port. The principal products of the colony, most of which are exported, are tin, gutta-percha, gambier, pepper, rubber, horns, hides, sugar, sago, tapioca, spices, dye-stuffs, coffee, and gums. The total imports and exports, exclusive of the coasting traffic, amounted in 1900 to 314,089,860 dollars and 262,617,345 dollars respectively. Tin was exported to the value of 61,103,111 dollars. The number of foreign vessels entering and clearing at ports of the colony in 1900 was 17,442, with a tonnage of 14,469,405; in the preceding year the native craft entered and cleared were 31,099 in number, with a tonnage of 1,207,900. A railway is being constructed to connect the town of Singapore with Kranji on the Johore straits, and the Perak State Railway is being extended into Wellesley, 23 miles, to connect at the coast with a steam-ferry for Penang. Government and grant-in-aid schools to the number of 210 exist, with an enrollment of 14,394.

STREET SPRINKLERS. See PAVEMENTS, STREETS, AND ROADS.

STRIKES. The year 1901 was distinguished for the number and bitterness of its labor wars. Organized labor appears to be determined in its demand for a larger share of the product. Employers are banding together for mutual support and defense against strikes. Courts are insisting that strikers shall keep more strictly within the law in their efforts to add to their numbers or to prevent outsiders from filling their places.

Machinists' Strike.—These three phases of economic conflict are all illustrated in the strike begun by the International Association of Machinists on May 20, 1901, which directly involved 75,000 machinists and affected a very much larger number of workmen. The demands of the union were for a nine-hour day without reduction in wages; or, in other words, an increase of 10 per cent. in hour wages. Besides this general demand, a large number of demands both for increased wages and various other concessions were made on separate employers. President O'Connell, of the Machinists, contended that the concession was warranted by the improvements in machinery during the past ten years, and that the reduction in hours would be compensated by the increased energy of the workmen. He stated that 40 per cent. of the machinists making the demand for shorter hours received the concession. The majority of the employers, however, resisted the demand, believing that it would be fatal to their independence to surrender to the unions through their organization. When the strike started the National Metal Traders' Association, including most of the larger firms and companies, was already in existence. The administrative council of this association held a meeting in Chicago on May 28, and adopted a declaration of principles which presents in detail the point of view of the typical employer as opposed to the typical unionist, stating among other things that while disavowing any intention to interfere with the proper functions of labor organizations, they would not admit of any interference with the management of their business. At the June meeting of the association, 1,400 concerns were represented and a large number of applications for membership were received. The unanimous sentiment of the association was in favor of resisting the efforts of the Machinists' Union, not so much because of the injustice of the particular demand, but because of the dangerous precedent which concession would establish. The association formally repudiated the agreement with the International Association of Machinists in the following words: "We declare that the Machinists' Union has, through its national and local officers, broken faith with us, and proven themselves to be an irresponsible body, with whom we can make no contracts which will be binding upon them." The declaration of principles formulated by the administrative council was adopted and ordered to be conspicuously posted in all the shops controlled by the members of the association. The association formally bound itself to support any member in upholding the declaration of principles. A permanent committee on strikes and finances was appointed and charged with the duty of raising a strike fund of \$500,000. The constitution of the association provides for the maintenance of a reserve fund by an initiation fee of \$25 and by an assessment not to ex-

ceed 20 cents per month for each operative employed by the members of the association. Extraordinary assessments were also provided for.

The president of the administrative council, after the adjournment, issued the following statement: "Our issue in the present strike is simply one of defense against unfair and unjust demands of organized labor and not against union or wages. We have been so harassed by the unions interfering with the management of our shops for the past year that the condition is no longer bearable. We insist on our right to introduce new methods and machines in our factories and to control our production." The June meeting of the association marks an epoch in the controversy between labor and its employers. The formation of industrial combinations in many lines has greatly strengthened the hands of the employing class in the industries thus controlled, as seen in the result of the steel strike described in a following paragraph. The National Metal Trades Association, however, is a union of competitors for the common end of defense, and cannot fail to be extensively copied in future strikes. The principal advantage to the employer of the "mutual support" mentioned in the foregoing resolutions is found in the fact that most strikes succeed because the employer fears to lose present contracts and future custom by failure to get work done on time. Particularly is this true of the great number of small establishments in most of which the striking machinists won their fight. But when large and small shops are banded together for common defense, there is no danger of loss from failure to execute contracts which can either be executed in other shops, or of necessity held over because no one shop is ready to take the work of another. It was also noticed during the machinists' strike that in many cases customers declared themselves ready to assist employers in resisting the demands of their men by waiting a considerable time for the execution of their orders. The result of this firm stand on the part of the employers was to bring forward a new phase of the struggle. The striking machinists began to lose ground. Their places were rapidly filled from the ranks of "handy men," whom they had attempted to exclude from the shops, and immediate resort was had to violence. This followed the usual course of such controversies. During the early days of a strike, labor is law-abiding. But when the strikers see their jobs going to others they can with difficulty be restrained from violent measures. In many localities, notably in Illinois, Ohio, and Connecticut, the strikers picketed plants and forcibly restrained non-union workmen from entering. Resort was immediately had to the courts, and the result was the issuing of so large a number of injunctions as to warrant the conclusion that a new principle of dealing with strikes has been established. Hitherto the injunctions have usually been granted on the ground that the public interest was endangered, as by the stoppage of the mails or the inciting to riot.

Of recent years, however, and especially during 1901, the courts have taken the ground that it was their duty to go much further than the conservation of the public interest, and to grant injunctions for the protection of the rights of employers to conduct their business without overt molestation or interference from strikes; and the right of workmen to pursue a lawful occupation without let or hindrance of any kind. The most sweeping injunction of this character was that issued by Judge Edwin B. Gager of the Superior Court for New Haven County, Connecticut. In the injunction 151 persons were named as defendants, and the sheriff was directed to attach their property in the sum of \$25,000. The injunction ran in part, as follows: "These are therefore, by the authority of the State of Connecticut, to command and enjoin . . . each and every one of you . . . under penalty of \$5,000 to wholly and absolutely refrain from . . . in any manner interfering with any person who may desire to enter the employ of the plaintiff by way of threats, persuasions, personal violence, intimidation, or other means . . . from boycotting the plaintiff or the plaintiff's workmen, either by threats, persuasion, intimidation, or otherwise; from interfering, intimidating, boycotting, or threatening in any manner any person or persons for the purpose of inducing such person or persons not to deal with or do business with the plaintiff or . . . the premises of the plaintiff's workmen; from congregating in the neighborhood of the premises of the plaintiff or in other places with the intent to interfere with the employees of the plaintiff or to interfere or obstruct in any manner the business or trade of the plaintiff; . . . from all concerted action or otherwise doing any act or causing any act to be done or causing noises which would interfere in any manner with the employees of the plaintiff, or their business or property." A large number of similar injunctions were granted during the progress of the strike, although none so sweeping as that of Judge Gager. These injunctions appear to have been well received by the public, and it is safe to say, mark a new era in strike history.

Albany Street Railway Strike.—Perhaps the most violent strike of the year was that of the street railway employees in Albany, N. Y., which arose out of the refusal of the demand of the employees' union that certain non-union men be either dismissed from the employ of the company or compelled to join the union. On May 14 the

company tried to run cars, but these were stoned, and the attempt failed. Two thousand militia were sent to Albany, but the disorder continued, many persons being wounded and two killed by the soldiers. On the 18th the company and the employees reached an agreement which provided for an advance of wages, but reserved to the company the right to employ non-union men. See NEW YORK.

National Cash Register Strike.—The strike in the works of the National Cash Register Company excited considerable interest on account of the humanitarian policy which had been previously pursued by the management of this factory. The principal stockholder and general manager was perhaps the foremost advocate of a "progressive" policy in dealing with his employees. The most friendly relations with the employees were cultivated. A library and reading-room, bathing facilities, lockers, a gymnasium, and athletic field were provided by the management, and the utmost consideration was shown the employees at every point of contact with the management. The manager prided himself on his policy toward his employees, and this plant was widely known as a model factory. In spite of this considerate policy, which was coupled with high wages that were increased as profits rose, the National Cash Register Company during most of last year was engaged in a serious dispute with a portion of its employees, which has resulted in an abandonment of philanthropic principles in the management, and a placing of the plant on a strictly business basis. The main grounds of dispute were as follows: The Local Metal Polishers' Union was worsted in a conflict with the Dayton Manufacturing Company, and was, therefore, left with a number of idle men on its hands. The committee of the union in the works of the Cash Register Company insisted that whenever a vacancy occurred in their shop it should be filled by one of these discharged employees of the Dayton Manufacturing Company. The management acceded. The foundry department was the next and final cause of disagreement. Of the thirty-two foundrymen sixteen were union men, the foreman being a non-union man and peculiarly obnoxious to the unionists because of his connection with an unsuccessful strike in another factory eleven years before. A year and a half before this foreman discharged two men and refused to take them back, although the union demanded their restoration through its international officers. The company, however, paid the men fifteen dollars a week for three months to assist them in finding other employment. At the end of that time the international officers allowed the pensions to be discontinued after a long discussion. The next act of the union, which had been formally recognized by the company, was to announce that no employee should earn more than \$4.50 per day—some of the hands had been earning \$7 per day on piece-work. The company acceded to this rule, and as a result of the additional hands from other works which were forced upon them by the union, the working force was so much increased that many of the moulders finished their allotted tasks by noon, and the shop during the afternoon became a lounging and smoking room. The result was a new arrangement of work by which the moulders did a full day's work for \$4.50, suffering to the extent of the difference between this sum and their former wages, from the advent of the union into the shop. In January, 1901, three men were laid off because there was no work for them to do. After a hearing before the international committeeman, the company was sustained. In March and April three more men were laid off, two for lack of work and one for cause. One of these secured other employment, leaving five men out of work. The local union, in the latter part of April, in spite of the previous references to the officers of the general organization, and in spite of the statement of the company that there was no work for the men to do, made a formal demand for their reinstatement, and on the company's refusing to employ them ordered a strike in the moulders' department. On April 29 all the moulders went out. A few days after the demand was reiterated by a committee of metal polishers. A second refusal was followed by a strike of all the polishers. As a result of these two strikes the company was forced to close the works, which subsequently reopened on a non-union and strictly business basis, the management having gone so far as to apply and obtain a sweeping injunction against the strikers and being rewarded by a boycott resolution by the American Federation of Labor. The breakdown of this attempt to harmonize the interests of capital and labor emphasizes the sanity of an opinion which is coming to be widely held that the only effect of such policies is to "spoil" the workers and make their demands as unreasonable as their treatment has been unbusinesslike.

In spite of the large number of strikes that have recently occurred, there is much reason to believe that the sentiment of the stronger unions favors greater caution in employing this means of settlement. The Industrial Commission in its report on Trade and Labor Organizations summarizes the policy of labor unions in relation to strikes. The claim is made that the whole tendency of union rules is to put a check upon hasty strikes. The more highly organized national unions provide that before a strike is ordered, the local union must approach the employers and try to make a settlement, either directly or by arbitration. If this fails, the local union votes on the

question of striking. A two-thirds or three-fourths affirmative vote is usually required. This decision is then reported to the national organization, and the report must often give the number of members, the number who will be affected by the proposed strike, the number of non-union men in the place, the state of the finances of the local union, and other detailed information. "On receipt of this report it is in many unions the duty of the national president to go to the place where the trouble exists, or send a personal representative there, and join with the local officers in renewing negotiations with the employers and trying once more to effect a peaceful settlement. Only after this renewed effort has failed is it permitted by the constitutions of many unions that the national executive board approve the action of the local. In some half-dozen unions, this power does not rest with the executive board, but with the members at large, and the local strike can be approved only by a referendum vote."

Steel Strike.—Theodore F. Shaffer, president and chairman of the executive board of the Amalgamated Association of Iron, Steel, and Tin Plate Workers, declared a strike to take effect on July 15, 1901, against the American Sheet Steel Company, the American Steel Hoop Company, and the American Tin Plate Company, three of the ten constituent companies of the United States Steel Corporation (*q.v.*). The direct cause of the strike was the refusal of the corporation to sign the "scale," that is, to declare as "union" the various mills of the three companies involved. These three companies were steel and tin rolling and finishing concerns. They obtained from the Carnegie Steel Company, the Federal Steel Company, and the National Steel Company—three other companies of the steel corporation—primary steel products, billets, ingots, and slabs, and converted them into tin and steel plates, cotton ties, structural material, and the like. The Amalgamated Association was comprised mainly of men engaged in rolling mills of the companies, though it had also a scattered membership in other branches of the trade. Formed on August 4, 1876, the Amalgamated had grown rapidly until in 1890 to 1893, it lost its hold on the Carnegie mills in the terrible Homestead strike, and through separate disagreements lost also the sheet steel plants at Apollo and Leechburg, Pa., and the large mills of Jones and Laughlins. For some time thereafter the association was held in partial disrepute, both because it had been defeated and because its motive in initiating these strikes was questionable. Later, however, and mainly through the unionizing of the American Tin Plate Company, the association regained prestige. The situation before the strike was that the Amalgamated had a membership in many of the mills of the Sheet Steel, Steel Hoop, Tin Plate, Federal Steel, and National Tube Companies of the Steel Corporation, and that several of the best equipped and largest mills of those companies were not unionized.

Now the association, from the time that the Steel Corporation had been formed early in the year, had been strenuously endeavoring to unionize all the mills of the corporation. The reason for this, as specifically stated by President Shaffer, and by Samuel Gompers, president of the American Federation of Labor, was the necessity of building up a countervailing labor power to offset the additional power gained by capitalized interests in the formation of the Steel Trust. For, as the argument was advanced, the Steel Trust was one of the greatest labor employers, and would inevitably, therefore, if unrestrained, become one of the greatest of labor oppressors; hence it was imperative for labor to prepare for defense by aggressive action. Reasoning from precisely the opposite point of view, it is probable that the Steel Trust on its side considered that there were already as many union mills as was consistent with the safety of the company. For when the trust signed the "scale" for a mill, it also agreed to settle "all differences that might arise between the workmen and the mill owners" in accordance with the rules of the association; and thereby the association was made a managing director in the mill. This was not especially important so long as the trust retained a sufficient number of non-union mills that could be relied upon to keep in operation twenty-four hours a day if necessary, in strike and out strike. But if all the mills were unionized, the trust would be left at the mercy of the association, alternative skilled workmen in sufficiently large numbers could not be obtained, and the association would be able to dictate the price at which trust products should be delivered to the trust by the association. Nor was this all. For the "scale" of the Amalgamated contained stringent provisions limiting the amount of work which its members could perform, and so restricting the output of the mills. While it was not claimed that the Amalgamated, however well organized, would in the near future endeavor to go the length of English unions, in shortening hours of labor and scaling down production, it was thought that the Amalgamated was at least tending in that direction. On the other hand, the Carnegie Company, which was absolutely non-union, afforded a striking example of the benefits which both employers and employed might obtain from an absolutely individualistic régime, with favor extended to none, and the highest rewards within reach of all. With these arguments in view, there seems little reason to doubt, from the evidence adduced,

that the trust did resolve to keep certain of its mills non-union, that it did in pursuance of this policy require the workmen of these mills to sign an anti-union pledge, and did discharge a number of men for breaking that pledge; and such action, if it was committed, was in direct violation of the "Anti-Discrimination Law" of Pennsylvania.

Cause of the Strike.—With both sides thus bent upon control of the mills that occupied the strategic position in the corporation, the clash came at the time for signing the annual "scale" of the Amalgamated to go into effect on July 1. The union then asked that the "scale" be signed for all mills of the Sheet Steel and Steel Hoop companies, including the important non-union mills of the Sheet Steel Company at Wellsville and McKeesport, and the Clark, Painter, and Lindsay and McCutcheon, non-union mills of the Steel Hoop Company. The company replied that it would sign the "scale" for all mills previously signed for and also for the McKeesport and Wellsville works. The union not agreeing to this then brought the Tin Plate Company into the controversy. With this company the union had had no trouble. Contracts for the ensuing year were already signed for all of its mills except those of Monessen, and these latter, owing to the special work carried on there, had been regularly operated under a special "scale" with the full consent of the union. But when trouble was experienced with the other two companies, the union, disregarding its valid contracts and for the reason that the Tin Plate was the most thoroughly unionized of all the corporations' companies, demanded that the regular "scale" should be signed for the works at Monessen as well as for all the mills of the Sheet Steel and Steel Hoop companies, and when this was refused, a strike was declared against all three companies.

Course of the Strike.—When the strike went into effect some 60,000 men, it was said, went out, of whom the larger number were either unskilled laborers whose employment depended upon the skilled workmen, or were men in allied branches of the industry who struck in sympathy with the Amalgamated. The declaration of the union that the men in the non-union mills would have joined the union if the trust had allowed it, appeared in part to be true, for most of the non-union mills were temporarily forced to shut down. Of the companies, the Tin Plate suffered most severely, all of its mills except Monessen being closed; the Steel Hoop continued to run in full only its plant at Portage, while the Sheet Steel had its usual output cut about in half. When the union perceived that the strike was making but moderate headway, negotiations were again entered into with Mr. J. Pierpont Morgan, the organizer of the trust, and with Mr. Charles M. Schwab, its president. At a conference held on August 3, the association practically offered to accept the trust's compromise offer of July 13. But the trust now refused to be held by that offer, and agreed only to sign the "scale" for mills that had been previously signed for, and then with the exception of the Old Meadow and Saltsburg mills. As an agreement to this effect would be virtually an acknowledgment of defeat by the association, the association met the proposal by declaring a further strike, to take effect after August 10, "of all Amalgamated and other union men in name and heart" at work in the remaining partially unionized companies of the corporation. These companies were the National Tube, National Steel, and Federal Steel, and with all their union works contracts had been signed by the Amalgamated. The breaking of these contracts was generally criticised by the press (see ARBITRATION, LABOR), and the only justification of its action advanced by the union was the curious one that "the contractor was greater than the contract."

With the going into effect of President Shaffer's second strike order, the defeat of the Amalgamated Association became certain. For the order represented the last throw of the Amalgamated, and in response to it only a few mills were closed down in addition to those already idle. Nor was this result changed by various small gains subsequently effected by the union, for the trust immediately neutralized these by starting up mills that had been thrown out by the first strike order taking effect July 15. The union closed a few mills of the Federal Steel and National Tube companies, and the trust started up several mills of the Tin Plate and Sheet Steel companies, and the important Painter, Clark, Lindsay and McCutcheon plants of the Steel Hoop Company, the advantage in each case remaining with the trust. The moral and financial support offered to the association on August 9 by the American Federation of Labor, a loosely organized body, but with an estimated membership of 900,000, proved in time of need to be of little practical avail; appeals of the union for financial assistance from the public received scant attention, and in fine the strike drooped. As a matter of fact, the association had committed a grave tactical error in first declaring a strike against only three of the trust's companies, and so forewarning the others, and in later giving the trust the better half of a week's notice before the second strike order went into effect.

The association now perceived that the only question was how to save the skeleton of its organization from the general wreckage, and negotiations were once more en-

tered into with the trust, and a final agreement was reached on September 14. By these terms, the "scale" was to be signed for the mills of the American Steel Hoop Company that had been previously signed for, and for two less mills of the Sheet Steel Company and seven less of the Tin Plate Company than had before been in the union. All the demands of the association made in July when the trouble was initiated, for the unionization of independent mills, were dropped out of consideration. Instead, the union consented not to organize or grant charters to any non-union mills of the Tin Plate Company, and agreed that the corporation might in its discretion terminate the "scale" in any of its mills or companies after October, 1902. In his official note to the lodges on September 24, informing them of the final outcome, President Shaffer stated that the ill results of the strike had been brought about by the failure of the American Federation of Labor to give promised financial aid, to the hostile attitude of public sentiment and the press, and to the desertion from the union of hundreds of Amalgamated men. And the president intimated what was already well known, that the union was split in pieces by disaffection and dissatisfaction with the conduct of the strike, and that its ultimate reestablishment and prosperity was a matter of great doubt.

It is indeed strictly true, as stated by President Shaffer, that public sentiment had borne heavily against the association. For the strike was confessedly initiated not for higher wages or for less hours of labor, but to consolidate the union's power. And this motive was induced, as Mr. Gompers said, by the reflection that "if the trust by its great wealth can prevent the extension and growth of the Amalgamated Association, it encompasses its disintegration and destruction." "Organized labor advances or recedes—never stands still." And therefore the union proposed to fight for further power. The public press, in considering this motive, drew an analogy to the condition of industrial labor in England resulting from the solidification of union labor there (see GREAT BRITAIN, paragraph Trade and Commerce), and was inclined to conclude that the legitimate function of labor unions was the redress of grievances and the increase of wages coincidentally with the increase of production, and not as in this instance and as in Great Britain, the mere gain of power, the curtailment of legitimate labor competition, and the control of the contracts of employers. Perhaps the most even-minded view of the whole matter was taken by the *Journal of Commerce*, which held in effect that there was no question of right or morals on either side; that the controversy was fundamentally a "higgling in the market place;" labor combined, as was its right, asking a price, and capital combined, as was also its right, making a counter offer; "the costs to abide the event."

Notwithstanding the very numerous and vociferous recommendations that were made by interested and disinterested parties for the settlement of this particular controversy and for the prevention of further controversies of a similar nature (see ARBITRATION, LABOR), it nevertheless remained true that the strike had its initiative, ran its course, and was finally settled in accordance with the ordinary laws of trade, supply, and demand, and self-interest, and without any considerable light having been shed on the perplexing problem as to the proper relations which employers and employed should bear one another. Really the only thing demonstrated, was the obvious fact that under given conditions the trust could beat the Amalgamated and had beaten it. As stated by Mr. W. F. Willoughby, of the Department of Labor, "Had the strike resulted in a definite determination of the relations between organized labor and organized capital, the result would have been well worth the sacrifice. As it is, nothing has been gained. No principle has been agreed upon, and there remains the same likelihood as ever that the contest will be renewed some time or other in the future." How much, or rather how little, the strike affected the finances of the trust will be seen under UNITED STATES STEEL CORPORATION.

STUBBS, Rt. Rev. WILLIAM, English historian and bishop of Oxford, died at Oxford, April 22, 1901. He was born at Knaresborough, in Yorkshire, Eng., June 21, 1825, and was educated at the Ripon Grammar School and Christ Church, Oxford, where he graduated in 1848. In 1850 appeared his first published work, *Hymnale Secundum Usus Sacrum*, and in 1858 came *Registrum Sacrum Anglicanum*, an elaborate calendar of the English bishops from St. Augustine's time. This work attracted the attention of Archbishop Longley, who, in 1860, appointed him librarian of Lambeth; and in that position Bishop Stubbs pursued the researches into English history which made him final authority in his field. In 1858 he began work on the *Rolls Series*, to which he contributed (1864) *The Chronicles and Memorials of Richard I.*, a work remarkable for insight and accuracy. In 1866 he succeeded Goldwin Smith as Regius professor of modern history at Oxford, beginning his important historical work at that university by the volume of *Select Charters*, published in 1870. Bishop Stubbs's great work was the three-volume *Constitutional History of England* (1874-78), which at once became a standard work on English history to the time of the Tudors. He was appointed canon of St. Paul's in London in 1879, was consecrated bishop of Chester in 1884 and translated to the see of

Oxford in 1889. Bishop Stubbs was an honorary LL.D. of Cambridge, Edinburgh, Dublin, and Heidelberg universities, a member of various learned societies in America, France, Germany, Denmark, Russia, and other countries, and was chancellor of the Order of the Garter.

STUMM, Baron KARL FERDINAND VON, German industrialist and politician, died near Saarbrücken, March 8, 1901. He was born there March 30, 1836, and was educated at the universities of Bonn and Berlin. In 1858 he succeeded to the direction of the Neunkirchen Iron Works, founded by his father in 1806, and from then until his death managed the concern with its 10,000 employees, in a manner that doubled its importance and greatly raised the social condition of its workmen. He was also active in political affairs, being a member of the Prussian Diet from 1867 to 1870, and the *Reichstag* from 1867 to 1881 and from 1889 until 1901. He was made a baron in 1888. Baron von Stumm was an ardent supporter of Bismarck's tariff measures and was a bitter opponent of Socialism in every form.

SUBLAMINE is the name given to ethylenediamine sulphate of mercury. This is a surgical disinfectant for the hands and the skin, and a general antiseptic and bactericide in gynaecology, dermatology, etc. It is said to be equal in effect and action to bichloride of mercury, with the advantages of being non-irritant even in a 2 per cent. solution, of penetrating more deeply into the tissues than does bichloride, and of being extremely soluble in water. The ethylenediamine in composition prevents irritation and conglutination of albuminous constituents. Ethylenediamine is an organic base with the composition $(CH_2-NH_2)_2$, a clear alkaline, colorless fluid, with a specific gravity of 0.97, readily soluble in water, and of an ammoniacal odor. Sublamine is in solid form, and may be made into tablets.

SUDSBURG, JOSEPH M., brevet brigadier-general U. S. V., died at Baltimore, Md., April 8, 1901. He was born in Munich, Bavaria, in 1825, entered the Bavarian army and after some years of service became second lieutenant in the Royal Artillery. He took part with the people in the revolution of 1848, and fled to Switzerland upon the defeat of his party. In 1861 he came to the United States and enlisted in the Second Maryland regiment on the Union side. He immediately became captain of his company, and afterwards recruited the First German Rifles. He was active in the campaigns in Virginia, rising to the rank of colonel and brevet brigadier-general.

SUEZ CANAL. A waterway connecting the Mediterranean and Red seas, 87 miles in length, comprising 66 miles of artificial canal and 21 miles of lakes. It was opened for navigation in November, 1869; six years later the British government acquired by purchase, shares amounting to £4,000,000 (value in 1900, £26,451,000). The canal was neutralized by the convention of October, 1888. In 1899 there passed through the canal, 3,607 vessels, with a tonnage of 9,895,630, representing 20 nationalities; in 1900 the number of vessels was 3,441, of 9,738,152 tons. The two leading nationalities were Great Britain and Germany. In 1899 the British tonnage amounted to 66.6 per cent. of the total, and the German tonnage to 10.8 per cent. In 1900, the ratio of British shipping fell to 57.6 per cent., while that of Germany rose to 15.1 per cent. In the same year a slight increase was noted in the percentage of French, Dutch, Austrian, Russian, and Japanese vessels. The noticeable falling off in the number and tonnage of British vessels in 1900 was attributed to the trouble in China and South Africa. In 1900, 127,945 civilians and 154,249 troops passed through the canal.

SUGAR INDUSTRY. Sugar during 1901 occupied a prominent place in economic and industrial discussions both in the United States and Europe. As the sugar industry in many nations of Europe is stimulated by government bounties or other legislative benefits, its production and consumption are not governed by the ordinary economic laws and conditions which, broadly speaking, apply to other commodities. Often the export cost is far less than that to the domestic consumer, and as a result there has been in many cases a production far in excess of the domestic consumption, which of course must go to other nations which do not produce sugar. Now if these nations were to place an increased or countervailing duty or duties on sugar produced under such conditions, as does the United States, and thus favor the sugar of nations where no bounty is paid, the effect on commerce in general, and sugar production in particular, would be most disturbing. Should England, a large consumer of continental sugar, take such a step the European manufacturers would be face to face with a serious situation which might mean, so it is asserted, the extinction of their sugar industry in a single day.

With a view to settling some of these disputed questions and putting the industry on a firm basis, an international sugar conference was called and met at Brussels on December 16, 1901. It was stated that the countries of Europe participating in the conference, with the exception of Russia, were in favor of abolishing sugar bounties, and that if France would abolish its export bounties and agree to a gradual reduction of domestic bounties, such a plan would be feasible. In Germany there is a large sugar trust known as the sugar *Kartel*, and other trusts exist in other countries,

notably Austria. This matter was also discussed, and it was suggested that those countries which did not have such organizations be allowed to give a bounty of two francs for each 100 kilos (220.4 pounds). The subject of countervailing duties, such as are imposed by the United States, was also discussed; but final action on all of these questions was put over into the following year, the delegates returning to their respective countries to submit preliminary reports and receive instructions.

In the United States there has been considerable discussion during the year 1901 over sugar, especially in connection with the question of the duty to be placed on sugar coming from Cuba, and the Philippines, and other insular possessions. The reduction of the duty on Cuban sugar was urged generally by the Cubans themselves, and many influential men and newspapers in the United States, who considered that something should be done to ameliorate the condition of the people of the island whose business, owing to uncertain financial and political conditions, was threatened with serious depression. The mercantile interests engaged in trade with Cuba naturally favored some scheme of reciprocity whereby the commerce with the island might be stimulated and opportunities supplied for the investment of capital and a general industrial development. Certain sugar refiners, notably H. O. Havemeyer, of the Sugar Trust, also advocated that the duties on raw sugar from Cuba should be reduced, and predicted that such action would bring about the reduction of the price of refined sugar to the consumer. This not only would benefit the public generally, but would lead to an extension of such industries as the making of jellies and preserves, which in England are by no means unimportant. Against any reduction of the duties on raw sugar, the beet-sugar interests and the cane-sugar growers of the South and Hawaii most vehemently protested, and these protests, which found currency in the press, were towards the end of the year brought to the attention of the ways and means committee of the House of Representatives. Although this discussion was not finished by the end of 1901, it is possible to give some of the points involved. With the protection furnished by tariff or bounties, both State and national, at one time or other and as a result of scientific methods of agriculture and manufacture, the beet sugar industry in the United States has had a large growth, as will be seen from the statistics near the end of this article. Considerable capital has been invested in factories and machinery, and the culture of beets by farmers has been found profitable in certain localities. The beet sugar people claim that theirs is an infant industry, entitled to protection until firmly established, and that free raw sugar would not only ruin their business, but would put the consumer at the mercy of the great Sugar Trust (American Sugar Refining Company), which refines raw cane sugar. In this connection it must be remembered that the beet sugar factory turns out refined sugar from the beets themselves, while the refineries use the raw sugar which has been extracted from the cane at or near the plantations. The chief spokesman for the beet sugar people was Mr. Henry N. Oxnard, an owner of factories for the production of sugar from beets. Mr. Oxnard's case, however, was weakened by a letter written by him and Mr. W. Bayard Cutting, January 12, 1899, advocating the culture of beets and investment of capital in beet sugar factories, in which he gave a very favorable forecast to the development of the industry. In this he said that "there is no fear that Cuban production, even under annexation to the United States, can in our day expand to the point where the United States would become exporters of sugar instead of importers, and hence that protection would no longer protect;" that sugar would be produced cheaper in the United States than in Europe, especially as this industry is merely agricultural, and the result would be the same as in the production of other crops where the United States can undersell all nations; that taking the prices under the McKinley tariff (1890-94), when sugar was admitted free of duty, there would still be a profit to the beet-sugar producers with absolute free trade. In 1901, however, the beet-sugar interests, led chiefly by Mr. Oxnard, appeared in Washington, arguing against any reduction in the duties on sugar from Cuba or any of the insular possessions, Mr. Oxnard being quoted as saying: "We cannot compete with the Cubans. If conditions as to cost of machinery and labor were equal, we might be willing to take our chances with them; but as things are now, this is impossible." On the other hand, competent sugar authorities say that the protection would be for the manufacturer rather than for the farmer, who does not receive any more for his beets than the farmer in Germany, where refined sugar is produced at a cost of less than 2½ cents per pound, and there is no reason why factories in this country, which have already made beet sugar at a cost of 3 cents per pound, should have such exorbitant protection. The situation at the close of the year was well summarized by Willett and Gray in the *Weekly Statistical Sugar Trade Journal*, where they say: "The way is now open, as regards Cuba, by reason of an election, which has virtually given her a president and full list of officials to carry on an independent government and make satisfactory treaties with the United States. Entire free duty sugar would be none too much relief for the prevailing conditions there, and would be no detriment to the American Beet Sugar Industry. The American Beet Sugar Industry has made

larger progress in the past year than in any other year in its history, both in the increased number of factories built and in the amount of sugar produced, and this industry is now founded on such a solid basis that free sugar from Cuba will not retard its progress during the years to come. In fact, we are quite convinced that this industry will astonish its best friends by its increase during the coming ten years, and the only possible effect that free-duty sugar can make will be to deter the building of beet factories where they ought never to be built by reason of unfavorable conditions and to throw the industry more largely into such States and locations where 3 cents per pound granulated and less is now being produced and can be considered as a permanent cost at least in the years to come. There are plenty of such locations awaiting the promoters of the industry, and, with the constant fear of free duty sugar removed, by its actual presence, as far as Cuba is concerned, the incentive to increase beet production in the United States will be wonderfully increased, notwithstanding all talk and predictions to the contrary."

In the following table is given, in tons, the sugar crop of the world for 1901 and previous years, as estimated by Willett and Gray:

WILLETT & GRAY'S ESTIMATES OF CANE SUGAR CROPS AT END OF 1901.
(These figures include local consumptions of home production wherever known.)

	1901-02.	1900-01.	1899-1900.	1898-99.
United States:				
Louisiana.....	294,000	275,000	132,000	245,511
Porto Rico.....	100,000	80,000	35,000	53,828
Hawaiian Islands.....	800,000	821,461	288,521	292,507
Cuba, crop.....	875,000	636,866	308,543	345,280
British West Indies:				
Trinidad, exports.....	50,000	50,000	41,000	53,430
Barbados, exports.....	60,000	60,000	50,000	45,789
Jamaica.....	30,000	30,000	27,000	27,000
Antigua and St. Kitts.....	25,000	25,000	18,000	22,000
French West Indies:				
Martinique, exports.....	32,000	32,000	30,000	31,630
Guadeloupe.....	35,000	35,000	30,000	39,390
Danish West Indies—St. Croix	13,000	13,000	12,000	12,000
Haiti and Santo Domingo.....	45,000	45,000	45,000	60,000
Lesser Antilles, not named above.....	8,000	8,000	8,000	8,000
Mexico, crop.....	95,000	93,000	78,000	50,000
Central America:				
Guatemala, crop.....	9,000	9,000	12,000	11,000
San Salvador, crop.....	5,000	5,000	5,000	4,500
Nicaragua, crop.....	3,500	3,500	4,000	3,750
Costa Rica, crop.....	1,500	1,500	1,000	750
South America:				
British Guiana (Demerara), exports.....	95,000	95,000	80,000	82,000
Dutch Guiana (Surinam), crop.....	6,000	6,000	6,000	6,000
Venezuela.....	3,000	3,000	2,000	.....
Peru, exports.....	105,000	105,000	100,381	61,910
Argentine Republic, crop.....	115,000	114,252	91,507	72,000
Brazil, crop.....	215,000	190,000	192,700	154,436
Total in America.....	2,516,000	2,235,569	1,567,652	1,732,780
Asia:				
British India, exports.....	15,000	15,000	10,000	10,000
Siam, crop.....	7,000	7,000	7,000	7,000
Java, crop.....	765,000	710,120	721,993	689,281
Japan (consumption 170,000 tons, mostly imported).....	.....	.....	2,000	.....
Philippine Islands, exports.....	70,000	62,000	62,785	93,000
China (consumption large, mostly imported).....	.....	.....	.....	.....
Total in Asia.....	857,000	784,120	803,778	799,281
Australia and Polynesia:				
Queensland.....	117,000	92,554	123,289	164,241
New South Wales.....	19,000	19,000	15,500	28,000
Fiji Islands, exports.....	33,000	33,000	31,000	34,000
Total in Australia and Polynesia.....	169,000	144,554	169,789	226,241
Africa:				
Egypt, crop.....	95,000	94,860	98,500	87,900
Mauritius.....	145,000	175,267	157,025	186,487
Reunion.....	35,000	35,000	35,000	37,781
Total in Africa.....	275,000	305,127	290,525	312,168
Europe—Spain.....	33,000	33,000	33,215	25,000
Total cane sugar production (W. & G.).....	3,850,000	3,502,390	2,864,969	3,095,450
Europe beet sugar production (Licht).....	6,710,000	6,088,994	5,518,048	4,982,101
United States beet sugar production (W. & G.).....	150,000	76,859	72,944	82,471
Grand total cane and beet sugar—tons.....	10,710,000	9,668,243	8,455,961	8,110,022
Estimated increase in the world's production.....	1,061,757	.....	.....	.....

Beet Sugar.—The following is Mr. Licht's estimate in detail of the European beet-sugar production of the 1901-02 campaign as compared with preceding campaigns:

	1901-02.	1900-01.	1899-1900.	1898-99.	1897-98.	1896-97.
Germany.....tons	2,270,000	1,979,098	1,798,631	1,721,718	1,862,867	1,836,536
Austria....."	1,260,000	1,094,043	1,108,007	1,061,290	831,667	934,007
France....."	1,300,000	1,170,833	977,850	890,122	821,286	762,061
Russia....."	1,060,000	920,000	806,737	776,066	738,715	726,667
Belgium....."	860,000	840,000	802,865	744,017	766,397	766,009
Holland....."	190,000	178,061	171,029	149,763	126,668	174,206
Other countries....."	400,000	367,460	263,929	209,115	196,245	202,990
Tons.....	6,710,000	6,066,994	5,518,048	4,982,101	4,831,774	4,916,496

The following table is of interest, inasmuch as it gives the consumption of sugar in the United States in 1901 and localities from which the supplies were obtained:

CONSUMPTION OF SUGAR IN UNITED STATES FOR CALENDAR YEAR 1901.

(Tons of 2,240 lbs.)

Total consumption of sugar from foreign countries and insular possessions:		
Cane.....	1,672,629	
Beet.....	217,266	
Refined.....	42,616	
Total.....	1,932,511	
Of which from Hawaii.....		309,070
Porto Rico.....		66,279
Philippines.....		5,100
Total.....	380,449	
Of which from Cuba.....		559,800
Consumption of domestic production:		
Louisiana and Texas, cane.....	292,150	
Domestic beet.....	124,859	
Maple.....	5,000	
Molasses sugar.....	17,977	
Total of domestic production.....	439,986	
Total consumption 1901.....	2,372,516	
Of which not dutiable:		
Domestic cane.....	292,150	
Domestic beet.....	124,859	
Domestic maple.....	5,000	
Domestic molasses.....	17,977	
Total.....	439,986	
Porto Rico.....	66,279	
Hawaii.....	309,070	
Philippines (duties assessed but refunded by Supreme Court).....	5,100	
Total free of duty 1901.....	820,435	
Consumption of dutiable sugar 1901.....	1,551,881	
Consumption of Cuban sugar 1901.....	559,800	
Dutiable sugar outside of Cuba 1901.....	992,081	

The consumption per capita was 69.7 lbs. in 1901, 66.6 lbs. in 1900, 61.0 lbs. in 1899, 60.3 lbs. in 1898, 63.5 lbs. in 1897, 60.9 lbs. in 1896, 64.23 lbs. in 1895, 66.64 lbs. in 1894, 63.63 lbs. in 1893, 63.76 lbs. in 1892, 67.46 lbs. in 1891, 54.56 lbs. in 1890, 52.64 lbs. in 1889, 54.23 lbs. in 1888, 53.11 lbs. in 1887, 52.55 lbs. in 1886, 49.96 lbs. in 1885, and 51 lbs. in 1884.

The consumption of refined sugar in the United States during 1901 was 2,287,828 tons, as compared with 2,219,847 tons in 1900. The business of sugar refining in the United States is largely in the hands of three concerns, the American Sugar Refining Company (the well-known "Sugar Trust"), the National Sugar Company, and on a smaller scale, the Arbuckle Refinery. The American Sugar Company and the National Company, though different corporations, work in substantial harmony, and their interests are believed to be closely connected. The Arbuckle works, on the other hand, often make lower prices or oppose the trust, though their output is comparatively small. In 1901 the American Sugar Refining Company manufactured 1,325,406 tons of refined sugar, or 57.9 per cent. of the entire consumption, as compared with 1,465,349 tons, or 68.5 per cent., in 1900. The independent refiners in 1901 manufactured 812,048 tons, or 35.5 per cent., as compared with 627,137 tons, or 28.7 per cent. in 1900. Of the output of independent companies, that of the National Sugar Refining Company in 1901 was 276,000 tons. Refined beet sugar consumed in 1901 was 107,859 tons, or 4.7 per cent., as compared with 68,386, or 3.1 per cent., in

1900. The product of foreign refineries consumed in the United States in 1901 was 42,515 tons, as against 17,743 tons in 1900, while the raw sugar, or that in plantation condition, was 84,488 tons, as compared with 51,232 tons in 1901. Considering the question of prices, it is found that the difference in price between raw and refined sugar in 1901 averages 1.003 cents per pound, as compared with .754 cents per pound in 1900. This enabled the manufacturers to make a greater profit than in the previous year.

Granulated sugar varied in price (net cash) from 5.29 cents a pound to 4.37, the average price for the year being 5.05 cents. This price can be compared with previous years' averages as follows: 1900, 5.32 cents; 1899, 4.919 cents; 1898, 4.965 cents; 1897, 4.503 cents; 1896, 4.532 cents; 1895, 4.152 cents; 1894, 4.12 cents; 1893, 4.812 cents; 1892, 4.346 cents.

The growth of the beet-sugar industry in the United States during the past ten years is shown in the following table from Willett and Gray's *Statistical Sugar Trade Journal*, giving the quantities of beet sugar produced and the number of factories in operation each year from 1892-93 to 1901-02:

Years.	Sugar Produced. Tons (2,240 lbs.).	Factories Operated.
1901-02	*150,000	39
1900-01	76,859	34
1899-00	72,944	31
1898-99	32,471	15
1897-98	40,399	9
1896-97	37,536	7
1895-96	29,220	6
1894-95	20,092	5
1893-94	19,550	6
1892-93	12,018	6

*Estimated.

The beet-sugar industry in the United States had its origin in the Western States, and of the six factories in existence in 1892-93, three were located in California, two in Nebraska, and one in Utah. In 1900, there were eight factories in California, three in Nebraska, and four in Utah. In nine other States, factories were in operation. There were ten in Michigan, making this State, in point of the number of factories, the leading State in the Union, and three in each of the States of New York and Colorado. In Ohio, Illinois, Minnesota, New Mexico, Oregon, and Washington there are single factories. The capital invested in the industry in 1900 amounted to \$20,958,519.

According to Dr. H. W. Wiley, chief chemist of the United States department of agriculture, beets can be grown in almost any soil except where the subsoil is hard; but the culture is not profitable unless crops averaging 10 or 15 tons to the acre are produced. The cost of beet raising averages between \$30 and \$40 per acre, and the beets should bring in the market about \$4 a ton. The development of the industry, as has been intimated, is likely to depend on the tariff legislation.

SUICIDES. The number of suicides in the United States during 1901, as compared with former years, was as follows: 1901, 7,245; 1900, 6,755; 1899, 5,340; 1898, 5,920; 1897, 6,600; 1896, 6,530; 1895, 5,759; 1894, 4,912. A considerable increase is apparent in recent years. Of the total number in 1901, 5,850 were males and 1,395 females, showing the same proportion as for several years past. The causes of self-murder were reported as follows: Despondency, 2,980; unknown, 1,643; insanity, 674; ill health, 618; domestic infelicity, 541; liquor, 439; disappointment in love, 283; business losses, 67. The agencies used in committing suicide with the number of persons employing each were as follows: Poison, 3,106; shooting, 2,476; hanging, 614; drowning, 613; cutting throat, 356; jumping from roofs and windows, 58; throwing themselves in front of locomotive engines, 27; stabbing, 23; fire, 23; dynamite, 11; starvation, 6.

SULLY-PRUDHOMME, RENÉ FRANÇOIS ARMAND, French poet and critic, received the Nobel Prize (*q.v.*) for idealistic literature in 1901. He was born in Paris, March 16, 1839. After studying at the Lycée Bonaparte he took up a business career, being employed in the Schneider factory at Creusot, and afterwards as a notary's clerk in Paris. In 1865 he published his first volume of verse, *Poésies*, which at once attracted attention by reason of its delicate sentiment and finish of style. Soon afterwards, upon inheriting an independent fortune, he turned his attention wholly to poetry, and his work won for him in 1881 the highest recognition in the French literary world—an election to the Academy. His verse throughout has been marked by dictional precision and a philosophical elevation of thought, and his criticisms have displayed thorough insight and appreciation. His published poetry in-

cludes: *Les Epreuves* (1866); *Les Solitudes* (1869); *La Nature des Choses*, a metrical translation of the first book of Lucretius, with a striking preface (1869); *Les Destins* (1872); *Les Vaines Tendresses* (1875); *La Justice* (1878); *Le Prisme, Poésies Diverses* (1886); and *Le Bonheur* (1888). As a critic he has published two volumes, *l'Expression dans les Beaux-Arts* (1884); and *Réflexions sur l'Art des Vers* (1892).

SULPHUR. The production of sulphur in the United States in 1900 amounted to 3,525 short tons, valued at \$88,100, as compared with 4,830 short tons, valued at \$107,500 in 1899. The supply in 1900 was obtained from Louisiana and Utah; but it is insignificant when compared with the large amounts imported from Sicily. The consumption of native sulphur in the United States in 1900 amounted to 3,147 long tons of domestic material and 167,696 long tons of imported. The consumption of sulphur derived from pyrite (*q.v.*) amounting to 92,077 long tons of domestic and 147,118 of imported material, giving a total domestic consumption in 1900 of 408,038 long tons.

SUMATRA, the westernmost of the Dutch East Indian islands, has an estimated area of 161,612 square miles and a population estimated (1897) at 3,209,037. The native inhabitants are Malays, but the Chinese are increasing rapidly. The Dutch control, exercised through a governor under the authority of the governor-general of the colony of Dutch East Indies (*q.v.*), is complete only in the coast districts, their sovereignty in the native states of the interior being merely nominal. The principal products are tobacco, coffee, and cotton. In 1898 there were 115 tobacco plantations producing 20,527,171 kilogrammes. There are valuable coal deposits, which are practically unworked. During 1901 there was considerable fighting between the colonial forces and the native troops of Achin, a state in northern Sumatra, which has hitherto maintained its independence. The Dutch troops were generally successful, and at the close of the year, it seemed probable, after almost a century of incessant warfare, the Achinese would acknowledge nominally the sovereignty of the Netherlands.

SUN, MOTION OF THE. See ASTRONOMICAL PROGRESS.

SUNDAY-SCHOOL ASSOCIATION, New York State, is an interdenominational body, the object of which is to "improve the character and efficiency of Sunday-school work, and to extend its influence." It is organized into eight districts over the counties of the State, in which are comprised 450 town Sunday-school associations, 8,469 Sunday schools, and 1,275,510 members, including 119,754 officers and teachers. A feature of the educational work is the normal classes, of which there are now about 125. There are also eight field workers, under the direction of the missionary committee, who are engaged for a considerable part of each year in general organization, evangelistic, and educational work. During the past year 58 county conventions were held, 40 new Sunday schools established, and \$341,993 contributed to benevolent enterprises. The forty-sixth annual convention of the association met June 11-13, under the presidency of J. W. Miles, of New York, at Binghamton, the general theme being *The Work, The Workers, The Workshop*. The treasurer reported for the current year total receipts of \$8,089.92, with a balance of \$173.36 to the new account. The meeting of 1902 will convene in June, at Saratoga Springs. Rev. A. F. Shaffler, D.D., New York, chairman of the executive committee; Timothy Hough, Syracuse, secretary and treasurer; Rev. A. H. McKinney, State superintendent.

SUNDAY-SCHOOL UNION, AMERICAN, organized in 1824 for the purpose of establishing Sunday schools in the United States wherever they are needed, and to provide them with suitable literature. It is supported entirely by voluntary contributions, and during its existence of 77 years has founded 104,682 schools, with 593,404 teachers and 4,196,493 scholars, and has given aid in about 250,000 instances additional. Missionaries are maintained in every State, and the publishing activities are extensive, the issues in 1901 including 9 new books, 56 new and revised editions, and 1,112 sets of picture illustrations of the "Life of Christ," besides the regular issues of mine periodicals, Scripture text buttons, etc. Since 1878, special meetings have been held regularly, with few interruptions, to aid teachers in the study of "The International Series of Sunday-school Lessons." This effort has met with an attendance ranging from 250 to 400 teachers. Corresponding secretary, John R. Whitney, 1122 Chestnut Street, Philadelphia.

SUNDERLAND, BYRON, American Presbyterian clergyman, died at Catskill, N. Y., June 30, 1901. He was born at Shoreham, Vt., in 1819, and was educated at Middlebury College and at the Union Theological Seminary, where he graduated in 1843. For nearly fifty years he was pastor of the First Presbyterian Church in Washington, D. C., becoming widely known as chaplain of the Senate during the Civil War, and again from 1873 to 1880.

SUPRARENAL EXTRACT. The suprarenal capsules, or adrenals, are ductless glands, two in number, situated at the back of the abdomen, one over each kidney. In 1855, Thomas Addison, of Guy's Hospital, London, published reports of the malady called Addison's disease and was the first to ascribe it to the proper cause, namely, disease of the suprarenal bodies. Addison stated the leading features of the ailment to be "anæmia, general languor, and debility, remarkable feebleness of the heart's action, irritability of the stomach, and a peculiar color of the skin [bronzing] occurring in connection with a diseased condition of the suprarenal corpuscles." It has been supposed that some fluid elaborated by the adrenals finds its way into the economy, and that disease or removal of these bodies whereby this elaboration is diminished or checked results in Addison's disease. Administering suprarenal extract to victims of this disease has not been very successful in combating it. But the extract has been used for various other purposes. It is an astringent, by emptying the blood vessels, when applied to a mucous membrane, as that of the eye or nose. It has been used locally in hypertrophic nasal catarrh with great relief from stenosis, and has also proved efficacious in occluded nasal passages during hay-fever, with much transient relief. In 1901 Somers, of Philadelphia, employed an aqueous extract of suprarenals with success in persistent nosebleed. Its advantage lies in its cleanliness, the absence of clot, the formation of no eschar, and the fact that repair of denuded epithelium occurs rapidly if repeated applications of the remedy are made. Floersheim, in 1901, used suprarenal powder by the mouth in certain heart conditions, finding that a weak and irregular heart became stronger, and more regular; a dilated heart became contracted; diffused murmurs became localized and less in intensity, or even disappeared; normal cardiac sounds became clearer; the pulse was brought nearer the normal; and weak patients with organic heart disease improved. See ADRENALIN.

SWEDEN, the eastern political division of the Scandinavian peninsula, is a constitutional monarchy. The capital is Stockholm.

Area, Population, and Education.—The total area is 172,877 square miles, and the population, according to the census of December 31, 1899, 5,097,402, an increase in ten years of 312,421, or an average annual increase of 31,242. The foreign-born population in 1890 numbered 24,548. Except 19,505 Finns and 6,846 Lapps (1890) the population is wholly Scandinavian. The largest city—Stockholm—has 302,462 inhabitants. The state religion is that of the Lutheran Protestant Church, the adherents of which number 4,735,218. Other sects are numerically small. In 1898 the elementary schools, with 15,907 teachers, were instructing 740,007 pupils, at an expense of 18,478,838 kroner, over one-fourth of the sum being from state funds. Children not attending government schools must prove an adequate private education to the school authorities. There are two universities, at Upsala and Lund.

Government and Defense.—The executive authority is vested in the king, who is also the king of Norway. He is advised by a ministry of eleven members. The legislative authority devolves upon a parliament of two houses; members (150) of the upper chamber are elected by the provincial diets and certain municipal corporations, and members (230) of the lower chamber by popular vote. The suffrage, however, is limited by certain property qualifications. The provinces are governed by prefects, nominated by the king; Stockholm by a governor-general. The present sovereign, Oscar II., ascended the throne in 1872.

The Swedish army is composed of the *Värfrade*, or enlisted troops, and the *Indelta*, or militia. The permanent army comprises under regular establishment 39,123 men of all arms. There is, besides, the *Värnpligtige*, or final reserve, which, added to the army and the militia, provides for perhaps 450,000 men on war footing. The navy comprises about 14 armor-clad ships and gunboats, and about 40 other vessels more or less available for service.

Finance.—The monetary standard is gold and the unit of value is the krone. The budget for the fiscal year 1901 balanced at 145,681,000 kroner, an increase over the previous year of 8,374,000 kroner. The principal receipts were: Customs, 49,000,000 kroner; railway, land tax, domains, etc., 21,901,000 kroner; imports on spirits, 27,000,000 kroner; and a surplus from previous years, 29,000,000 kroner. The chief ordinary expenditures were: Army, 28,220,084; interior, 18,019,550; education and the church, 13,361,074; and navy, 8,652,295. The public debt, contracted for railway construction, amounting in 1900 to 317,489,122 kroner. The krone is worth 26.8 cents.

Industries, Commerce, etc.—The chief crops are wheat, rye, barley, oats, pulse, and potatoes. The estimated value of the entire cereal yield in 1899 was 252,300,000 kroner. Mineral production in 1899 was: Iron ore, 2,434,606 tons; silver and lead ore, 5,730 tons; copper ore, 22,334 tons; zinc ore, 65,159 tons; manganese, 2,622 tons; coal, 239,344 tons. Gold is also mined to some extent. Recently there has been a rapid growth in manufacturing industries; the number of factories increased from 5,083 in 1895 to 10,304 in 1899. The wood-working industries are the most im-

portant, with a product value of about 197,000,000 kroner. There are 555 iron and steel working establishments, producing a value of about 54,800,000 kroner. Paper, textile fabrics, and brewing are important industries.

The total imports and exports in 1899 were valued at 504,800,000 kroner and 358,200,000 kroner respectively, the total trade exceeding that of any previous year. The chief imports in 1899 were: Coal, 61,000,000 kroner; textiles, 46,700,000 kroner; machinery, 28,300,000 kroner; coffee, 20,500,000 kroner. The exports of wood products amounted to 140,100,000 kroner; iron and iron wares, 42,000,000 kroner; paper stock, 23,700,000 kroner. Sweden's largest foreign trade is with Great Britain; Germany, Denmark, Norway, and Russia standing next in the order named. At the end of 1900 there were 7,024 miles of railway, of which 2,392 miles belonged to the state. The telegraph lines at the same date had a length of 5,719 miles, besides 3,739 miles of railway telegraph.

History.—In the early months of 1901 the parliament was largely occupied with a discussion of army and navy reorganization and military reforms proposed by the ministerial or Conservative party and favored by King Oscar. After protracted debate the government measure, which greatly increased both the peace strength of the army and the term of service, was defeated and a compromise measure proposed by the Moderates was accepted (May 29). By this measure the army and navy were to be reorganized, terms of service with the colors being fixed at 240 days for infantry, 300 days for the navy, and 365 days for cavalry and artillery. Appropriations of 3,800,000 kroner for fortifications and 6,500,000 for the navy were voted a few days later. The act was accepted on June 25 in rather bad grace by King Oscar, who declared in a protocol to his acceptance that he did not consider this disposition of the matter final. With all the discussion the parliament found time to enact laws limiting the issue of bank notes to the Reichsbank and providing for state accident insurance for industrial and agricultural laborers. A proposal for the abolition of the death penalty was rejected by both chambers, and a joint resolution was passed pledging government aid for the agricultural population in the northern province. On May 7, Minister of Marine Dyrssen resigned because of criticism of his administration of his office, and was succeeded on May 31 by Rear Admiral Pelander.

Successful experiments in the manufacture of steel by electricity that were carried on at Gysinge during 1901, led to the decision to construct an extensive plant for that industry, and work was at once begun on new factories on the Dal-Elf River. The imposition of a higher duty on English coal has led to the establishment of several plants to render the hitherto almost worthless native coal fit for use.

SWEDENBORGIANS. See NEW JERUSALEM, CHURCH OF THE.

SWIMMING AND WATER POLO. The swimming championships of the Amateur Athletic Union were contested for at Buffalo July 9, 1901, and E. C. Schaeffer again won the 100, 220, and 440 yards championships, establishing for the last an American record of 6m. 26s. At the same meeting Otto Wahle, of the New York Athletic Club, established new American records from 660 yards up to 1 mile, as follows: 660 yards, 10m. 37.4-5s.; 880 yards, 14m. 21.4-5s.; 1,320 yards, 21m. 47.4-5s.; one mile, 28m. 52.3-5s. J. A. Jarvis, of Leicester, England, who holds the 500 and 880 yards championship, on July 13, won the one mile championship in the Marine Lake, at West Kirby, Liverpool, by 150 yards, in 25m. 13-5s., and on July 20, in the River Thames, over a course from Kew to Putney, against a head wind, won the long distance championship, 5 miles and 120 yards, from 19 competitors, in 1h. 9m. 0.2-5s. Water polo is much more popular in Great Britain than in the United States. In the international Scotland and England twelfth annual contest, England won 8 goals to none. The finals of the English inter-club matches of 1901 were won by Manchester (Osborne) over Worthing, six goals to two.

SWINTON, JOHN, labor leader and economist, died in Brooklyn, N. Y., December 15, 1901. He was born near Edinburgh, Scotland, December 12, 1829, and came to the United States with his father at an early age. After learning the printer's trade in Illinois, he went to New York City, where he studied for a time at the New York Medical College. In 1860 he became an editorial writer on the *New York Times*, a position he held for ten years. Then in 1875 he went to the *Sun*, and his connection with that paper continued, with an interruption of four years (1883-87), when he was publishing *John Swinton's Paper*, until 1897. Mr. Swinton was an active and enthusiastic advocate of organized labor, writing and speaking with absolute fearlessness. Before and during the Civil War he was an ardent Abolitionist, and afterwards, during the labor riots in New York City (1874 and 1877), he attracted attention by his speeches. He published *The New Issue: The Chinese-American Question* (1870); *Current Views and Notes of Forty Days in France and England* (1880); *John Swinton's Travels* (1880); *Life of John Brown* (1881); and *Striking for Life* (1894).

SWITZERLAND, a federal republic of central Europe, formed by the union of 22 cantons. The capital is Berne.

Area and Population.—The area is 15,976 square miles. The population on December 1, 1900, was 3,312,551, as against 2,933,334 in 1888, the increase in the twelve years being 394,873, and the average annual increase 32,906. The largest cantons in population are: Berne, 591,316; Zurich, 431,866; Vaud, 285,050; and St. Gallen, 251,138. The population is about 70 per cent. German, 23 per cent. French, and 6.7 per cent. Italian. The latest census, compared with that of 1888, shows a relative increase of the French speaking population, from 218 per thousand inhabitants to 230; and of the Italian from 53 per thousand to 67; while the German speaking population had decreased from 714 to 697, and those speaking Roumansch dialects from 13 to 12. According to this census there were 2,313,105 persons speaking German, 733,220 French, 222,247 Italian, 38,677 Roumansch, and 14,087 speaking other languages. The principal cities are Zurich, having by official estimate 150,000 inhabitants; Geneva, 105,000; Basel, 113,000; Berne, 64,000, and Lausanne, 56,000.

Government and Defense.—The present constitution, dating from May 29, 1874, provides for a federal parliament of two chambers, the upper, or state council, of 44 members, two of whom are chosen by each canton; and the lower, or national council, of 147 members, elected by popular vote, for a term of three years. The united houses, called the federal assembly, elect a federal council of 7, from among whom they choose also the president of the federation and vice-president of the council. The members of the council serve 3 years, the president and vice-president one year. Measures before the national assembly must be submitted to popular vote on the demand of 30,000 electors. The president for the calendar year 1901 was Ernest Brenner, of Basel, and for 1902, Joseph Zemp, of Entlebuch. Switzerland has no regular standing army. A militia establishment, however, exists, constituted as follows in 1900: The *Elite* (men from 20 to 32), 150,876; the *Landwehr* (33 to 44), 87,364; the *Landsturm* (all citizens, not otherwise serving, from 17 to 50), 277,007; total, 515,247.

Finance.—The monetary standard is gold and silver, and the unit of value is the franc, equal to 19.3 cents. The revenue for the fiscal year 1899 was 100,476,337 francs, and the expenditures 98,052,644 francs; for 1900, 101,033,716 francs and 102,757,837 francs respectively. The budget for 1901 showed an estimated revenue of 104,860,000 francs, and expenditures of 105,855,000. The deficit was due to a reduction of the customs, the most important source of the revenue. The financial situation of the republic, however, occasions no anxiety. The largest expenditure is for the military, the estimate for 1901 being 28,121,000 francs, an increase of about 700,000 francs over 1899. The public debt is about 90,000,000 francs.

Industries and Commerce.—Wheat, oats, maize, barley, flax, hemp, and tobacco are grown, together with most of the English vegetables, but to a great extent food-stuffs are imported. The waterfalls furnish power for manufactures, including silks, cottons, hats, lace, thread, woollens, and notably watches and clocks, for which Geneva, especially, is famous. Domestic trade is greatly assisted by the tourists, who visit the Alpine resorts. Cheese and condensed milk are important dairy products. In the special trade, the total value of the imports for 1899 was 1,162,594,825 francs, as against 1,065,305,202 francs in 1898; and the exports 796,013,909 francs, as against 732,826,245 francs. In 1900 the trade with Germany was: Exports, 201,573,150 francs (24.11 per cent. of the total exports); and imports, 350,356,570 francs; with France, exports 109,932,190 francs (or 31.53 per cent.); and imports, 207,358,840 francs; with Italy, exports, 44,180,290 francs; and imports, 182,008,600 francs. There are reported 2,396 miles of railway and 4,384 miles of telegraph lines.

Religion and Education.—The Roman Catholics constitute 40 per cent. of the population, and the Protestants 59 per cent. Except for inhibitions against the Jesuits, there is freedom of worship and general religious liberty. Instruction is compulsory for children between the ages of six and twelve. The recognized language of the schools is German, while French is taught in most of them. There are universities, modeled after those of Germany, at Berne, Basel, and Zurich.

History.—On January 1, 1901, a new era in state ownership began in Switzerland with the assumption of control of the Swiss Central Railway by the federal government. It was decided by referendum in 1898 that as soon as possible the Confederation should purchase the properties of five private railway corporations within its borders, the sum to be paid therefor to be equal to 25 times the net annual earnings and not less than the cost of establishment. The Central Railway is the first with which arrangements have been completed, the price agreed upon being 75,000,000 francs. Early in December, 1901, the National Council ratified the proposition for the purchase of the lines of the Northern Railway Company and of the Taggenberger Railway. With the entry of the federal government into the field of railway ownership the necessity for new legislation became evident. The unification and reduction of railway fares, and the establishment of a state accident insurance department were among the provisions advocated.

During 1901 M. Ernest Brenner occupied the position of president of the Confeder-

ation and Dr. Joseph Zemp, that of vice-president of the council. In December, 1901, as is customary, Dr. Zemp was chosen to succeed M. Brenner as president for 1902.

SYRIA. See **ARCHÆOLOGY** and **TURKEY**.

SZILAGYI, DESIDER DE, Hungarian jurist and statesman, died at Budapest, July 31, 1901. He was born at Groswarden, November 1, 1840, and was educated in law at Vienna, in Germany, and at Budapest. In 1867 he became connected with the Hungarian ministry of justice, and in 1870 was sent to England to study civil and criminal jurisprudence preparatory to a codification of the Hungarian law, in which he subsequently assisted. On the completion of this work in 1874, he became professor of criminal law and politics at the University of Budapest, retiring at the same time from the department of justice. From 1871 he was a Liberal member of the lower chamber of the *Reichstag*, served as a member of the financial committee (1877), and in 1889 was made minister of justice. He resigned this portfolio in 1895 and became president of the chamber. Throughout his political career, M. Szilagyi was extremely active and influential in every reform that looked to the modernization of Hungary.

TAIT, PETER GUTHRIE, professor of natural philosophy in Edinburgh University, died at Edinburgh, July 4, 1901. He was born at Dalkeith, Scotland, in 1831, and was educated at Edinburgh University and at Cambridge, graduating from the latter institution with high honors, being senior wrangler, first Smith's prizeman and a fellow of Peterhouse College. He was appointed professor of mathematics at Queen's College, Belfast, in 1854, and six years later became professor of natural philosophy in the University of Edinburgh. Professor Tait was the author of many works in physics and mechanics which have been of the greatest value to students. His *Dynamics of a Particle* (1856); *Quaternions* (1867); *Heat* (1884); *Light* (1884); *The Properties of Matter* (1885); *Dynamics* (1895); and his scientific papers collected and published in 1898, are all well known to scientists. He cooperated with Professor Balfour Stewart in the preparation of *The Unseen Universe*, and with Lord Kelvin wrote Thomson and Tait's *Natural Philosophy*.

TALC and SOAPSTONE. These names have been used very loosely to designate a number of minerals resembling true talc, but which are all hydrosilicates of alumina. In commerce the name talc has been applied simply to the fibrous varieties, and that of soapstone to the massive forms of talc, both being the same mineralogically. The term steatite, which is the same as soapstone, is often applied to the massive talc which is ground to flour. The production of talc and soapstone in 1900, exclusive of the fibrous talc mined in New York, was 27,943 short tons, valued at \$383,541. This was sold in the rough ground, sawed into slabs, or manufactured into various articles. The producing States were chiefly Georgia, North Carolina, and Virginia. The production of fibrous talc which is mined in St. Lawrence County, New York, in 1900 was 63,500 short tons, valued at \$499,500. It is used in paper manufacture. The imports for 1900 were 79 short tons, valued at \$1,070.

TANNER, CHARLES KERNS DRASE, Irish M.P. and physician, died at Reading, England, April 21, 1901. He was born at Cork, Ireland, in 1850, and was educated in Paris, at Winchester, at Queen's College, Cork, and at the Universities of Leipzig and Berlin. He practiced medicine in his native city until 1885, and became a popular and prominent figure there. In this latter year he was returned to Parliament from Mid-Cork, serving from that time until his death, first as a Parnellite and then as an anti-Parnellite. From the time of his election, Dr. Tanner took an exceedingly active part in the obstructive phase of the Irish Parliamentary campaign, and was a central figure in some of the most turbulent scenes in the House.

TANNER, JOHN RILEY, former governor of Illinois, died at Springfield, in that State, May 23, 1901. He was born in Indiana, April 4, 1844, and was brought up on a farm. At the outbreak of the Civil War he joined the Union army and served in the ranks throughout the conflict. Afterward he went to Illinois as a farmer, but soon began to take an active interest in politics. In 1870 he was elected sheriff of Clay County, and in 1872 clerk of the circuit court. Entering the State Senate in 1880, Mr. Tanner at once took rank as a Republican leader in the legislature. In 1886 he was elected State treasurer, and in 1890 he was appointed railroad commissioner. As chairman of the Republican State Central Committee in 1894, he brought himself into notice as a State leader, and in 1896 he was elected governor over John P. Altgeld.

TASMANIA, an island situated 80 miles south of Australia, and forming one of the states of the Commonwealth of Australia. Area, 26,385 square miles, including the adjacent small islands. The population at the census of 1901 was 171,066, against 146,667 in 1891, showing an increase of about 17 per cent. against 27 per cent. for the preceding decade. Capital, Hobart, with a population of 34,604. About one-fifth of the population is Roman Catholic and the rest Protestant.

Government and Finance.—The executive power is vested in the governor appointed by the crown and assisted by a responsible ministry of 5 members. The legislative council consists of 19 members elected for 6 years on a property qualification. The house of assembly is composed of 38 members elected for 3 years, also on a property qualification. The revenue and expenditure for 1901 were estimated at £1,054,980 and £923,731 respectively. The chief sources of revenue are customs, public services, and land. The public debt amounted in 1901 to £8,511,005.

Industries, Commerce, etc.—Tasmania had in 1900 over 225,000 acres under crops, of which the larger part was under wheat and oats. The live stock comprised, in 1901, 1,683,956 sheep, 165,516 head of cattle, and 31,607 horses. The minerals exported in 1900 were copper, £901,660; tin, £270,998; silver, £252,080; and iron and gold, £207,162. The imports and exports of Tasmania for 1901 were £2,073,657 and £2,610,617 respectively. The trade is chiefly with Great Britain and the other states of Australia, and the exports consist largely of wool and minerals. The total railway mileage in operation in 1900 was 594. The telegraph wires had a total length of 3,794 miles, and the telephone 1,193 miles.

History.—When the Rt. Hon. Edmund Barton formed the first federal ministry in December, 1900, Tasmania was not represented. The Tasmanians had been ardent Federalists and protested that they should have a member in the cabinet. Mr. Barton, excusing his action by saying that there were not enough portfolios to go around, added Hon. N. E. Lewis, the premier of Tasmania, to his cabinet, without portfolio. Later in 1901 Mr. Lewis resigned and Sir C. O. Fysh was appointed as the Tasmanian representative. At the opening of the legislature the premier proposed the imposition of an income-tax on all incomes over £80 a year, to make up for the loss suffered by free trade with the other states. The introduction of the Postal Regulations Bill in the federal Parliament called forth a protest from Tasmania. The bill provided for the abolition of racing lotteries by the exclusion from the mails of all letters addressed to or mailed by suspected persons or companies. In Tasmania lotteries had been legalized, and the state received a considerable revenue (£20,000 annually) from licenses. A resolution was therefore passed by the state legislature protesting against the indirect repeal by the federal Parliament of state legislation on a subject on which it was not empowered by the Commonwealth constitutional act to legislate directly.

Sir Arthur Elibank Havelock, formerly governor of Madras, was appointed governor of Tasmania in May, 1901. At Hobart on June 3 the Duke of Cornwall laid the foundation stone of a memorial to Tasmanian soldiers fallen in the Boer War.

TASTE, SENSATIONS OF. See **PSYCHOLOGY, EXPERIMENTAL.**

TAYLOR, THOMAS H., Confederate brigadier-general, died at Louisville, Ky., April 12, 1901. He was born at Frankfort, Ky., in 1825, and served with distinction through the Mexican War, rising from private to major. In the Confederate army, during the Civil War, he served as captain, and was promoted to brigadier-general. General Taylor was chief of police of Louisville for many years.

TAYLOR, Rev ISAAC, LL.D., canon of York Minster, died at Settrington, England, October 18, 1901. He was the son of Isaac Taylor, author of *The Natural History of Enthusiasm*, and was born at Stanford Rivers, Essex, May 2, 1829. He was educated at King's College, London, and Trinity College, Cambridge. Among his numerous works are: *Words and Places* (1864); *The Alphabet: An Account of the Origin and Development of Letters*, his most important publication (1883); and *Names and Their Histories* (1896).

TEACHERS COLLEGE. See **COLUMBIA UNIVERSITY.**

TELEGRAPHY, WIRELESS. See **WIRELESS TELEGRAPHY.**

TELPHERAGE. This new application of electricity to transportation made remarkable progress during 1901. For purposes of aerial transportation the telpher or conveyor consists of one or more electric motors, forming a motor truck or car, which runs upon a tightly-drawn cable supported on poles, convenient buildings, or special structures so as to be independent of conditions or obstacles upon the surface of the ground. The telpher is supported upon and moved along its overhead track by a grooved wheel or pulley rigidly fixed to the armature or revolving part of the motor. The speed of this telpher may, therefore, be regulated or fixed by controlling the speed of the motors or by the use of a driving pulley of a larger or smaller diameter. The telpfers are driven and controlled by an electric current from any convenient source, such as the usual electric-lighting or power circuits. The current is conveyed to the telpher by an insulated trolley wire, suspended above or near the motors, through a trolley wheel in contact with the wire as in the case of an overhead trolley street car. The carrying cable or track forms the return electric circuit. As the telpfers are electrically driven, they may be controlled by an operator manipulating electric switches located at convenient points along the line, or by means of automatic appliances can be made to start, stop, reverse, or slow down automatically. By reason of its automatic features telpherage is now used for a great variety of purposes.

TENEMENTS IN NEW YORK. In accordance with the report of the tenement-house commission appointed by Governor Roosevelt in 1900, an exhaustive law was passed by the New York legislature of 1901, designed to make tenements in New York City somewhat more habitable from the point of view of sanitation and cleanliness, to make them less inflammable in case of fire, and to provide for their supervision by competent authority. As stated by the tenement-house commission, the tenement problem in New York differed from that of any other city either in the United States or in Europe. In no other city, as alleged by the commission, could be found the solid blocks of so-called double-decked tenements that were built in New York. In other American cities the comparatively greater area of available ground reduced the necessity to which builders in New York thought they were subjected of using every single foot of ground in tenement districts to the exclusion of light and privacy, and even of decency. The typical double-decked tenement in New York consisted virtually of two sets of flats pressed up together and having a common hall and stairway. On each side of this tenement was in like manner pressed up a similar double tenement, while at the back a third tenement usually approached to within from six to ten feet. The only light that came into the tenement, therefore, was from the front and from small airshafts perhaps two feet square, sunk as it were between the double line of flats constituting the tenement. On each floor of a double tenement there were usually four families, two on each side of the common hallway. Twenty-four families could therefore be accommodated in a six-story tenement, and in addition, the cellar was usually utilized for the same purpose. The builders of these tenements usually explained the extraordinarily dirty condition in which they were found by stating that the tenements were originally as good as could be expected for the rent charged, and there was no use in overhauling them or endeavoring to keep them clean, since the tenants would bring them back to their dirty condition within a short time. Against the opposition of the builders, however, the law framed by the tenement-house commission to do away with the most patent evils of existing tenement houses, was passed by the legislature. This law laid down a great number of important provisions as to the fireproofing of tenements, the keeping of them in clean condition, and the construction of adequate airshafts and other means of ventilation. A tenement-house department was created and the supervision of tenements was given solely to this department and was taken away from the departments of fire, health, and buildings, which had previously exercised joint control over them. It was directed that in future no tenement should occupy more than ninety per cent. of a corner lot, and the height of buildings was regulated according to the width of the street upon which they face. At the rear of every tenement there should be an open space of ten feet as a minimum, and on inside lots this distance should be increased proportionately to the height of the building. The minimum width of courts was increased from two feet, four inches to six feet, so that though still narrow, these courts would not as at present be merely unventilated shafts for the accumulation of refuse. Other provisions of the bill prohibited the erection of new tenements with dark interior rooms and cellar rooms; stipulated that tenements over five stories high should be fireproof and that fire-escapes should be built in front of every non-fireproof tenement. Every tenement-house to be erected in the future was directed to have in the roof a fireproof bulkhead, with a fireproof door, and to have at least one flight of stairs extending from the entrance hall to the roof, and the stairs in public halls therein should be at least three feet wide in the clear. For every additional 80 rooms in non-fireproof tenements, and for every 120 additional rooms in fireproof tenements, there should be an additional flight of stairs. It was directed that every tenement thereafter constructed, fireproof or not, should have the stair halls and stairs of incombustible material. Entrance halls in all tenements should be $3\frac{1}{2}$ feet wide, and should be inclosed in brick walls. Other provisions for non-fireproof tenements alone were that no inside stairs should be built to the cellar; that beams might not be laid within two inches of brick partition walls, and that within the fire limits of the city no wooden tenement-house should thereafter be erected, and no wooden building at present not used as a tenement should be converted to such use. Outside of the fire limits, wooden tenements might be built of not more than two stories high, and not accommodating more than four families. Sanitation provisions made for tenements were: That there should be an adequate water supply at all times of the day and night; that the tenement-houses should be kept clean to the satisfaction of the board of health; that the walls of courts, inner or yard, and of shafts should be kept painted and whitewashed; that walls should not be repapered until the previous paper had been thoroughly removed; that if required by the board of health, a janitor or other responsible agent should reside in each tenement housing more than eight families; and that no room in any tenement-house should be so overcrowded that there should be afforded less than 400 cubic feet of air to each adult and 200 cubic feet to each child under twelve, while in living rooms and bedrooms there should be 600 feet to each indi-

vidual. Stringent provisions were made for debarring prostitutes from tenements, and the owner and lessee were made jointly and individually responsible.

TENNESSEE, a central Southern State of the United States, has an area of 42,050 square miles. The capital is Nashville. Tennessee was admitted as a State, June 1, 1796. The population in 1900 was 2,020,616, while in June, 1901, as estimated by the government actuary, it was 2,048,000. The populations of the four largest cities in 1900 were: Memphis, 102,320; Nashville, 80,865; Knoxville, 32,637; and Chattanooga, 30,154.

Industries.—From the census reports of 1900 it appears there has been a large growth in the manufacturing and mechanical industries of Tennessee during the last half century. Since 1850 the population has increased from 1,002,717 to 2,020,616, or 101.5 per cent., while the average number of industrial wage-earners has increased from 12,039 to 50,167, or 316.7 per cent., embracing in 1900 2.5 per cent. of the entire population, as against 1.2 per cent. in 1850. In 1900 there was invested in the 8,007 mechanical establishments reporting, a capital, exclusive of capital stock, of \$71,182,966; at the same time the gross value of the products was valued at \$107,437,879, while the net value, exclusive of materials re-used in the process of manufacture, was \$77,648,241. One of the chief causes of the increase of manufactures in Tennessee of late years has been the exploitation of its mineral deposits, including iron, copper ores, and coal, which were previously neglected. Flouring and grist-mill products is the most important industry of the State, having its centre at Nashville, and extensive establishments also in Knoxville and Memphis. The value of these products in 1900 was estimated at \$21,798,929, showing an increase since 1890 of \$9,324,645, or 74.8 per cent. The manufacture of lumber and timber products ranks second among the industries of the State, having products in 1900 valued at \$18,127,784, or an increase since 1890 of \$9,054,098, or 99.8 per cent. Manufactures of iron and steel had products in 1900 valued at \$5,080,624, an increase since 1890 of \$832,756, or 19.6 per cent. This industry has been stimulated by abundant deposits of fuel and ore. Coking coal is found in the Cumberland region, and the State in 1899 was sixth in rank among the coke-producing States. Other industries are as follows: foundry and machine-shop products valued in 1900 at \$4,074,509, but showing a decrease since 1890 of \$352,678, or 8 per cent.; the manufacture of textiles, with products in 1900 valued at \$3,907,279, or an increase since 1890 of \$183,141, or 4.9 per cent.; car construction and railroad-shop work, with products in 1900 valued at \$3,113,053, showing an increase during the decade of \$1,507,275, or 93.9 per cent.; manufactures of tobacco, with products in 1900 valued at \$3,010,602, an increase since 1890 of \$2,157,073, or 252.7 per cent. Tennessee produces several kinds of fine tobaccos in addition to the ordinary varieties; the most important of the best kinds being the bright tobaccos of Greene County and the fine red shipping tobaccos of the Clarksville district; the manufactures of cottonseed oil and cake were valued in 1900 at \$2,980,041, and manufactures of leather at \$2,802,117.

Negro Legislation.—Laws were passed by the Tennessee legislature in 1901 for the purpose of making the education of whites and blacks absolutely separate. One of these acts prohibited the teaching of blacks and whites together in any school or college and prohibited instructors, under penalty of fine and imprisonment, from teaching both whites and blacks in the same school. By another act boards of trustees in all public school districts of the State were enjoined from employing any teacher or principal who was not of the same race as the pupils in the school. Objection to these bills was made on the ground that Northerners had endowed certain of the Tennessee educational institutions on the agreement, or at least on the tacit understanding, that they should be coeducational as to race. But the legislature's answer to this was that the endowments which had been made were small, and that in any event the Southerners must be permitted to handle the negro problem as they considered wise. A bill introduced in the House to require street railway companies to furnish separate cars for negroes failed of passage.

Labor Laws.—An act passed by the legislature, amending an act of 1893, changed the age at which children might be employed in any workshop, factory, or mine from twelve to fourteen years of age, and directed that henceforth employers should be required, instead of as previously, merely permitted, to ascertain the true age of the children they employed. An important mining act intended to obviate, so far as possible, accidents in mines caused by carelessness or inefficiency, provided that all mine foremen or assistant mine foremen should henceforth be required to have certificates issued on the recommendation of a State board of mine examiners created under the act. To obtain this certificate from the examiners the applicant was to be required to pass a satisfactory examination and to show that he had had at least five years of actual mining experience. An act apparently intended to discriminate in favor of employees and against employers in case of any labor strike or difficulty, made it unlawful for an employer to bring laborers of any kind either from another State or from another part of Tennessee to his work-shop, factory or mine by "false representation," concerning the conditions of the work to be done and the payment

to be given for the work; and false representation was to be construed among other things to include the failure of an employer importing workmen to inform them of a strike, lockout, or other labor troubles at his works, if there was such. It was further provided that any person who brought people from another State or from another part of the State and hired them to guard his establishment or work with arms, without having first obtained a permit from the governor, should be imprisoned for not less than one and for not more than five years. But this last proviso was to apply only when workmen were brought from a distance by "misrepresentation." A workman injured by a violation of the act might recover damages, costs, and attorney's fees. An act was passed providing for the better ventilation of coal mines.

Corporation Laws.—Several corporation acts were passed by the Tennessee legislature, of which the following are the most important: It was provided that a tax should be levied upon all Pullman cars and all other cars except passenger cars owned by companies outside of the State but operated within the State. Street car companies were directed to equip their cars with vestibules from the first of November to the middle of March for the protection of motormen. For the purpose of encouraging the establishment of manufacturing enterprises in the State a constitutional amendment was proposed by the legislature to the effect that firms or corporations which might thereafter engage in manufacture in the State should, upon a two-thirds vote of the county court of the county wherein their business was located, be relieved in whole or in part of county taxes for a period not to exceed ten years, and should, by a two-thirds vote of the city council or other law-making body, be relieved in like manner and for the same period from city taxation. Insurance companies which did not pay their losses within sixty days after demand had been made upon them, unless such delay was in good faith or for cause, were to be required to pay interest and principal on the face of the policy, and in addition to pay 25 per cent. of the principal of the policy as a penalty for the delay.

Other Laws.—An act of 1883, providing for the redemption of the note issue of the bank of Tennessee, was repealed, the repeal to take effect April 1, 1901. Practically all genuine notes were believed to have been cancelled and the owners of any notes that might be outstanding were given until April, 1901, to present them. The Tennessee legislature ceded to Virginia the north side of Main Street, Bristol, thus fixing the State line in the centre of the street, and dividing Bristol equally between the two States, the law to go into effect as soon as ratified by Virginia and by Congress. It was made a misdemeanor for any person or corporation to sell, or to bring into the State for the purpose of selling, or giving away, any cigarettes, cigarette paper or substitutes therefor. An act was passed ceding to the United States, upon payment of the condemnation values therefor, any land which it might need in eastern Tennessee for the establishment of the proposed Appalachian forest reserve. Congress was petitioned to pass the so-called School of Mines Bill now pending, for the establishment of a school of mines in every State where one was not already located. Congress was also petitioned under article five of the constitution to propose an amendment for the direct election of United States senators. Amendments were proposed to the State constitution as follows: that the secretary of state should be made an elective officer instead of as at present an appointee of the legislature; that the governor should hold office for four years instead of for two, and that he should be made ineligible for more than eight years' service in twelve, instead of as at present for more than six years out of eight; that county officers should hold office for four instead of for two years, and that the treasurer and comptroller of the currency should be elected by a popular vote for a term of four years, instead of as at present being elected by the legislature for two years. In the interests of economy it was directed by the legislature that the State should be redistricted for State and congressional representatives upon the basis of population given by the federal census of 1900. The constitution of Tennessee provides that a census shall be made by the State every ten years for redistricting purposes; but it was estimated that such a census would cost at least \$20,000, and as the finances of the State were at a low ebb, the redistricting committee was authorized to consider the federal census as binding. In the same direction of securing economy in the administration of State affairs, committees were appointed to investigate the various departments and offices of the State department, to see if expenses could not be cut down, and similar committees were also appointed to inspect the various charitable institutions of the State. These acts of the legislature tending toward economy in State affairs, as well as the investigations ordered, were generally opposed as being a welcome change in the manner in which legislators usually heap up expenses for the electors. It was said that, while many new State offices ought to be created in Tennessee for the proper transaction of the business, on the other hand, many needless offices might well be abolished.

Elections.—On January 15 the legislature elected Edward W. Carmack United States senator for the full term ending March 4, 1907, to succeed Thomas B. Turley. The vote in the two branches of the legislature was: Edward W. Carmack, 29;

Thomas N. Burkett (Rep.), 3; not voting, 1. In the House: Edward W. Carmack, 70; Thomas N. Burkett, 21; not voting, 8.

State Officers.—Governor, Benton McMillin, Democrat; secretary of state, term four years, ending in 1905, John W. Morton; treasurer and insurance commissioner, B. E. Folk; comptroller, Theodore F. King; attorney-general, term six years, ending August, 1902, George W. Pickle; superintendent of public instruction, M. C. Fitzpatrick; commissioner of agriculture, Thomas Paine; chief justice, term six years, ending August, 1902, David L. Snodgrass; associate justices, W. C. Caldwell, John S. Wilkes, W. K. McAllister, and W. D. Beard. Court of the Chancery Appeals: Justices, M. M. Neil, S. F. Wilson, and R. M. Barton, Jr.—all Democrats.

Congressional Representatives (57th Congress).—In the House: Walter P. Brownlow, from Jonesboro; Henry R. Gibson, from Knoxville; John A. Moon, from Chattanooga; Charles E. Snodgrass, from Crossville; James D. Richardson, from Murfreesboro; John W. Gaines, from Nashville; L. P. Padgett, from Columbia; Thetus W. Sims, from Linden; Rice A. Pierce, from Union City; and M. R. Patterson, from Memphis—all Democrats, except Walter P. Brownlow and Henry R. Gibson, Republicans. In the Senate: William B. Bate (until 1905), from Nashville; and Edward W. Carmack, from Memphis—both Democrats.

TENNIEL, Sir JOHN, English artist, retired from the staff of the London *Punch* on January 1, 1901, after a continuous service of fifty years. He was born in London in 1820, and was educated at Kensington. His art education was largely self-acquired, though his talent was shown at an early age, one of his pictures being exhibited and sold while he was still a boy. In 1845 he painted a fresco in the palace at Westminster; and he has produced many pictures for private collections. In 1851 he joined the staff of *Punch*, and throughout his long experience he produced almost uninterruptedly a weekly political cartoon. These pictures came to be regarded as expressing in a peculiarly apt way the typical British attitude on current political topics. Among the most notable of the many striking cartoons drawn by him should be mentioned the series on Gladstone and Lord Beaconsfield, the "Old Pilot" cartoon, on the occasion of Prince Bismarck's retirement from the chancellorship, and the series of Lincoln drawings during the Civil War in the United States. Besides his work for *Punch*, he was widely known for his illustrations of popular books, including *Æsop's Fables*, *Lalla Rookh*, *Alice's Adventures in Wonderland*, and its sequel, *Through the Looking Glass*.

TENNIS. See LAWN TENNIS.

TETANUS. Kitasato was the first to cultivate, in 1888, in pure cultures, the bacillus of tetanus which was discovered by Nicolaier, of Göttingen, in 1885. The bacillus is found all over the world, in the soil, in the dust of hay, in cobwebs, on old shoes, in dirt taken from under finger nails (Babes), in the fæces of animals (Sanchez-Toledo), and rarely in human fæces (Babes). It will pass through the alimentary canal unchanged. In the ground, the presence of organic matter and heat will cause a great increase in numbers of the germs. Tetanus spores remain virulent for years (Babes), after being dried on threads, or on wood, or in the ground. The most frequent of many modes of entrance of the tetanus bacilli is by penetration of infected foreign bodies, such as splinters, nails, bullets, etc. Foreign bodies which penetrate deeply, together with dirt, forming wounds which are then sealed, are extremely dangerous. Next in importance of the causes of tetanus is infection of wounds not kept clean. Suppuration prepares the way for the tetanus bacillus. In most cases of tetanus following infection of a wound the first symptom appears in twenty-four hours; it may be delayed a few days. It consists of an involuntary contraction of the muscles of the jaw and cheek. These become rigid, and the jaw is set. The head is drawn back. The anterior abdominal muscles become set and rigid, and the patient has great difficulty in walking. In severe cases, the body is curved backward in a rigid arch, and the muscles of the thighs also become hard and stiff. These contractions may last for several hours before relaxation occurs, and be repeated over and over, till respiration becomes difficult, the surface becomes blue, and death ensues. In tetanus following infected wounds, the percentage of deaths is about 88. There are many mild cases that recover. The local treatment consists in cutting open the wound, scraping its surfaces, and curetting away all granulations, and cauterizing with carbolic acid. Internally, opium, chloral, and curarine have been used, each with success. Emulsion of lamb's brain has produced favorable results. But the antitetanic serum (the tetanus antitoxin) is being* used increasingly, though not to the exclusion of internal remedies. The serum is prepared by inoculating a horse with a mixture of the toxin of the disease obtained from a culture of the bacilli, combined with iodide of potassium. Progressively stronger inoculations are made every few days, and finally virulent cultures of the bacillus are injected. In time the serum of the horse's blood will furnish antitoxin of great strength. The lower part of the back of the neck is selected as the proper site for the injection of the serum into a human being attacked with tetanus. The

serum treatment has not proved effective in very grave cases, and no considerable statistics are available.

In November, 1901, six deaths from tetanus occurred in Camden, N. J., in the cases of children who were reported to have been recently vaccinated. A seventh case recovered, after antitoxin treatment. A panic ensued, vaccination was stopped, and children were admitted to the schools though never vaccinated. A thorough investigation of the cases resulted in the disclosure of the facts that the virus did not contain the germs of tetanus; that in all cases the tetanus appeared so late, that it is fair to assume that scratching the scabs or infection after removal of the scabs was the cause; and that one of the children who died of tetanus had not been vaccinated. Undoubtedly the tetanus bacilli were in the earth in Camden, and dry weather together with high winds had disseminated them. See *SERUM THERAPY*.

TEXAS, a southwestern State of the United States, has an area of 265,780 square miles. The capital is Austin. Texas was admitted to the Union December 29, 1845. The population in 1900 was 3,048,710, while in June, 1901, as estimated by the government actuary, it was 3,142,000. The populations of the three largest cities in 1900 were: San Antonio, 53,321; Houston, 44,633; and Dallas, 42,638.

Finance.—The receipts of the State treasury for the year ending August 31, 1901, were \$7,947,318.20, and the expenditures were \$8,307,022.21. The cash on hand in the treasury on September 1, 1901, was \$2,579,419.21. At the same time the State debt was \$3,989,400, all of which was bonded and the bonds held by the permanent school and other special funds, with the exception of \$717,200 in the hands of private individuals. The State tax rate for the year was 16.66 cents ad valorem. The total value of property in the State as returned for taxation was \$982,187,865.

Industries.—From the census returns of 1900 it appears that there has been a large growth in the manufacturing industries of Texas during the last half century. Since 1850 the population has increased from 212,592 to 3,048,710, while the average number of industrial wage-earners has increased from 1,066 to 48,152, embracing in 1900 1.6 per cent. of the entire population, as against .5 per cent. in 1850. In 1900 there was invested in the 12,289 manufacturing establishments reporting, a capital of \$90,433,882, exclusive of capital stock; at the same time the gross value of the products was \$119,414,982, while the net value, exclusive of materials re-used in the process of manufacture, was \$83,639,058. The leading industries in Texas depend upon the abundance of raw materials, that is, upon lumber, cotton, and wheat, while the large area of the State and the heavy freight charges tend to encourage the production of manufactures for local use. The manufacture of lumber and timber products is the most important industry of the State, with products in 1900 valued at \$16,296,473, an increase since 1890 of \$4,253,907, or 36.5 per cent. The manufacture of cottonseed oil and cake ranks second in the industries of the State, having products in 1900 valued at \$14,005,324 and showing the remarkable increase since 1890 of \$10,742,728, or 329.3 per cent. Allied to this industry is the ginning of cotton, whose receipts amounted in 1890 to \$1,172,298 and in 1900 to \$5,886,923. In both of these industries Texas ranks second in the Union, which is a natural result of its preeminence in cotton growing. Of the 93,325,729 gallons of cottonseed oil produced in the United States during the census year, 24,354,695 gallons, or 26.1 per cent. were produced in Texas, of which large quantities were shipped from Galveston to Mediterranean ports. Flouring and grist-mill products were valued in 1900 at \$12,333,730, an increase since 1890 of \$2,430,275, or 24.5 per cent. In 1900 Texas was sixth among the wheat-producing States, which accounts in part for its increase of grist-mill products; but besides its own production it depends also upon that of Oklahoma and Indian Territory. The fact that Texas is traversed by 9,886 miles of railroad, a greater mileage than that of any other State except Illinois and Pennsylvania, accounts for the fact that its car construction and general railroad shop-work in 1900 turned out products valued at \$8,314,691, showing an increase of \$5,454,456 since 1890 or 190.7 per cent. Dallas is the largest manufacturing city, having products in 1900 valued at \$11,480,499, and Houston comes next, with products valued at \$10,641,575. For an account of the recently discovered oil fields in Texas, see *PETROLEUM*.

Corporation Laws.—In view of the drastic anti-trust law passed by Texas in 1900 and its long sustained fight against the Standard Oil Company and other trusts, an act passed by the legislature in 1901, amending the corporation laws, was of considerable interest. This amendment authorized citizens of Texas to form corporations to engage in business in Mexico, Cuba, Porto Rico, the Philippines, and foreign countries, and the object of the law was very clearly stated to be that Texas should not be deprived "of the legitimate revenues that should be derived from the business enterprise of her citizens." Another corporation law, intended to prevent blacklisting, provided that while a corporation or firm might upon application give in writing a statement of the reasons why any employee was discharged, it should not anywhere publish a statement to prevent an employee who had voluntarily left the corporation from obtaining similar or other employment elsewhere. A corporation was also prohibited from endeavoring to accomplish this end by private correspondence, and

all these things were entitled "blacklisting," and were made punishable by a fine of \$250 or imprisonment for 90 days, or both. What appeared to be a somewhat equivocal law, though its avowed object was to protect laborers from imposition, provided that no firm, corporation, or agent thereof should hereafter pay their employees in tickets or checks payable in merchandise only; but all such tickets or checks should be negotiable for cash at their face value. An exception was made to this law, however, to the effect that corporations or firms who paid in cash monthly might in the interim grant merchandise checks at the instance and request of the employees. An amendment to the corporation law directing that domestic corporations and foreign corporations doing business in the State should have at least 50 per cent. of their capital stock subscribed for, and at least 10 per cent. of the authorized capital paid in, provided that in lieu of these requirements corporations might elect to have at least \$100,000 of their authorized capital paid up in cash. In other words, a corporation with \$1,000,000 authorized capital might under this alternative have 10 per cent. of its stock subscribed for and paid up and no more. And larger corporations would fare still better in being required to have a less proportion of their capital stock subscribed and paid for. An act for the relief of railway corporations, belt and suburban railway companies who had failed to construct their roads or branches or any part thereof, gave these companies a further period of two years within which to build.

Other Laws.—An important law passed by the legislature established an industrial institute and college for the education of white girls in the arts and sciences. This institution was to be known as the "Texas Industrial Institute and College for the Education of White Girls of the State of Texas in the Arts and Sciences," and its courses include, besides literary studies, many kinds of practical training for the purpose of "preparing girls for the practical industries of the age." The enrollment for the institute was to be made up by counties, each county being given its due proportion of girls with accordance with the total population of the county. An act was passed organizing a Ranger force, to consist of four companies, for the purpose of protecting the Mexican frontier against marauding and thieving parties and to suppress lawlessness and crime throughout the State, and clothing both officers and privates of the force with all the regular powers of peace officers and sheriffs. In order to prevent the sale of liquor intended to be used in those places where the sale of intoxicating liquor was prohibited by law, an act was passed, providing that when liquor was sold from one point of the State to another where the sale of liquor was prohibited, then the sale should be deemed to have taken place at that point where the sale of the liquor was solicited or where the goods were delivered or paid for. An act to discourage dishonest and incompetent lawyers, provided for the debarment of any attorney who should directly or indirectly solicit business or who should agree to loan or give money or other valuable inducement in case he was selected as attorney. The school system was amended by providing that in addition to the branches of study already taught in schools, the following should be taught: The effects of alcohol on the system, geography, mental arithmetic, Texas history, United States history, and civil government. A libel law enacted, provided that a truthful account of proceedings in a court of justice, or of executive or legislative proceedings, or of public meetings, or reasonable and fair criticism of official acts or matters of public welfare should not be construed as libel. And in any action for libel the defendant was to be permitted to give in evidence the intention of the publication, and any public retraction that had since been made and the truth of the statements were to be taken as defense to the action. Congress was appealed to under article five of the constitution to call a convention to propose an amendment for the direct election of United States senators. An amendment was proposed by the legislature to be submitted to the electors for ratification providing that in addition to the existing constitutional requisites for the suffrage, which were that a man should be 21 and should be either a citizen of the United States or should have declared his intentions of being such, there should be added the condition that if not a citizen of the United States, he should have declared his intention of being such at least six months before the election, and that all voters, subject to the poll tax, must pay the same before being entitled to vote. A very meagre act was passed for the relief of Galveston and the surrounding country which had suffered from the West Indian hurricane of 1900. It had been expected that some form of permanent relief would be granted by the legislature, but instead the legislature merely passed two measures of temporary relief as follows: By the first, the counties of Brazoria, Fort Bend, Wharton, Waller, Galveston, Colorado, Austin, Grimes, and Jackson were given until February 1, 1902, to pay their State and county taxes due in 1900; the second act remitted practically all of the State and county taxes to be collected from Galveston, these remitted taxes to be placed in a trust fund to be used solely for the purpose of aiding Galveston in paying interest and providing for a sinking fund on the bonds issued for the elevation of the city streets and sidewalks, and to protect the city from the calamitous overflows in the future.

Elections.—On January 27, Joseph W. Bailey (Dem.) was elected by the legislature as United States senator for the full term ending March 4, 1907. Mr. Bailey was nominated with practical unanimity, Horace Chilton, whom Mr. Bailey succeeded in the Senate, having withdrawn his name before the Democratic caucus. The vote in the two branches of the legislature was, in the Senate: Joseph W. Bailey, 2; E. A. Atlee (Dem.), 2; not voting, 2. In the House: Joseph W. Bailey, 110; Horace Chilton, 2; John H. Reagan, 1; M. M. Crane, 1; not voting, 14.

State Officers.—Governor, Joseph D. Sayers, Democrat; lieutenant-governor, J. N. Browning; secretary of state, appointed by the governor, John G. Todd; treasurer, John W. Robbins; comptroller, R. M. Love; attorney-general, C. K. Bell; superintendent of public instruction, Arthur Lefevre; commissioner of agriculture, Charles Rogan; chief justice, term six years, ending January 15, 1907, Reuben R. Gaines; associate justices, Thomas J. Brown and F. A. Williams—all Democrats.

Congressional Representatives (57th Congress).—In the House: Thomas H. Ball, from Huntsville; Samuel B. Cooper, from Beaumont; Reese C. de Graffenreid, from Longview; John L. Sheppard, from Texarkana; Choice B. Randell, from Sherman; R. E. Burke, from Dallas; Robert L. Henry, from Waco; Samuel W. T. Lanham, from Weatherford; Albert S. Burleson, from Austin; George F. Burgess, from Gonzales; Rudolph Kleberg, from Cuero; James L. Slayden, from San Antonio, and John H. Stephens, from Vernon—all Democrats. In the Senate: Charles A. Culberson (until 1905), from Dallas; and Joseph W. Bailey (until 1907), from Gainesville—both Democrats.

TEXAS, UNIVERSITY OF, Austin, Tex., with medical department situated at Galveston, Tex., is one of the chief coeducational institutions of the South. The university, opened in 1883, had in 1900-01 a faculty of 97 and a student-body, omitting duplicate names and 116 students in the summer schools, of 1,005, as follows: Literature, science, and arts, 653; law, 206; medicine, 192. Excluding the Summer School, this is a gain in all departments over the session of 1899-1900 of 10 per cent. The library contains about 35,000 volumes, the addition for the past year being 2,437 volumes. There are 98 schools throughout the State, whose pupils are accredited to enter the university without entrance examinations. The committee on affiliated schools published in February, 1901, *Bulletin No. 1*, a pamphlet of 83 pages giving suggestions concerning courses of study and the methods of teaching in high schools. The chief items in the president's report are an urgent call for funds to erect a large gymnasium, and an enlarged library and laboratory of bacteriology for the medical school. The total estimated university income for the year is \$181,018.

THAYER, JOSEPH HENRY, D.D., American educator, died at Cambridge, Mass., November 26, 1901. He was born in Boston, November 7, 1828, and was educated at Harvard, graduating in 1850, and at the Andover Theological Seminary. From 1859 to 1864 he was pastor of a church at Salem, Mass., and from 1864 to 1882 he was professor of sacred literature at Andover Seminary, going from there to become professor of New Testament criticism at Harvard University. Professor Thayer wrote *A Greek-English Lexicon of the New Testament* (1869); *A Biographical Sketch of Ezra Abbot* (1884); *Notes on Scrivener's Plain Introduction, etc.* (1885); *The Change of Attitude Toward the Bible* (1891); and *Books and Their Use* (1893). He received the degree of D.D. from Yale (1873), Harvard (1884), and Princeton (1896).

THIBET, a country of central Asia, nominally a division of the Chinese Empire, but practically independent in its internal relations, has an estimated area of 651,500 square miles, and an estimated population of 6,000,000. The capital is Lhasa. The country is ruled by the lamas, or Buddhist priests, the chief ruler being the Dalai Lama, who is assisted by a council. Two official residents at Lhasa represent the imperial government. The inhabitants continue to maintain a stubborn opposition to foreign travelers.

In the spring of 1901 the Dalai Lama sent a deputation to Russia. The members of the mission arrived at Odessa on June 25, and on July 6 they were received at Peterhof with great ceremony by the Czar. The purpose of the mission was not clear, though it was said to be of a purely religious character, having no political significance whatever. Nevertheless it provoked in some quarters the discussion of a Russian protectorate over Thibet. The St. Petersburg *Viedomosti* asserted that the Thibetans' one desire was to protect themselves from foreign invasion and suggested that the deputation had been sent to ask the Russians to interest themselves less aggressively "in the destiny of a country which, through its geographical position, is certain to remain *res nullius*." But the almost simultaneous concession on the part of China for a French railway in Yunnan suggested that, notwithstanding the great distance and the almost insuperable difficulties presented by the high plateaus and mountains of Thibet, Russia and France had perhaps begun a movement for the rail connection of the trans-Caspian country with Indo-China. The conjecture led to considerable discussion in the press. See HEDIN, SVEN.

THOMAS, JOHN ROCHESTER, American architect, died at Westminster Park, N. Y., August 27, 1901. He was born at Rochester, N. Y., June 18, 1848, and was educated at the University of Rochester. In 1874 he was selected as architect and commissioner for the erection of the Elmira State reformatory, and in 1882 he supervised the erection of the Calvary Baptist Church in New York City. The municipal building commission of New York City in 1896 chose Mr. Thomas's design for a new twenty-five-million-dollar City Hall out of 133 submitted, and when that project was abandoned he prepared the plans for the new Hall of Records. He designed the Eighth Regiment armory in New York City and over 150 churches and office buildings.

THOMPSON, DAVID P., American engineer and diplomat, died at Portland, Ore., December 15, 1901. He was born in Harrison County, O., November 8, 1834, and early in life worked on railway surveys and as a blacksmith's apprentice. After some years of experience as a compassman on government survey work, he joined the Oregon volunteers, and from 1861 to 1863 served as captain in the campaigns against the Indians. Taking up surveying once more, he built the first line of railroad in Oregon, and later, as president of the Oregon Construction Company, he built a large part of the lines of the Oregon Railway and Navigation Company, the Northern Pacific and Southern Pacific railways. In 1880-82 he was mayor of Portland; he served as State senator; and in 1892-93 he was United States minister to Turkey. At one time Mr. Thompson was president of seventeen national banks in the Northwest.

THOMPSON, (JAMES) MAURICE, American author, died at Crawfordsville, Ind., February 15, 1901. He was born at Fairfield, Ind., September 9, 1844, but spent most of his boyhood in Kentucky and Georgia, where he was educated principally by private tutors for the profession of civil engineer, although he also became a proficient student of ancient and modern languages. He served throughout the Civil War in the Confederate army, and afterward was chief engineer of a railroad in Indiana, a lawyer, a member of the State Assembly, 1878, and State geologist, 1885-89. He was an editor of the *Independent* for a number of years and was an industrious and successful writer of both poetry and prose. Some of his works are: *Hoosier Mosaics* (1875), a collection of newspaper sketches; *Songs of Fair Weather* (1883); *Byways and Bird Notes* (1885); *The Story of Louisiana* (1888); and *Alice of Old Vincennes* (1900), his most popular work. Mr. Thompson was an ornithologist of repute, and conducted expeditions in various parts of the United States in the interest of that science. His scientific and practical experience in wood and field, added to his native love of outdoor life, endowed him with a fine knowledge of nature-lore and woodcraft that embellish all of his writings. He was also an enthusiastic archer, and his *Witchery of Archery* (1878) contributed to the revival of interest in that once popular sport.

TIME, STANDARD. See ASTRONOMICAL PROGRESS.

TIN. No tin was produced in the United States in 1901, the entire supply for this country coming from the Malay Peninsula. This is shipped through Singapore and goes under the name of the Straits tin. It comes to the United States via England. A. H. Brooks notes the finding of cassiterite or stream tin in considerable quantities on Buhner Creek, Alaska, which is a tributary of the Anakovik River and about three miles from Bering Sea. The tin occurs in gold-bearing gravels (U. S. Geol. Survey, Min. Res., 1900, pp. 267-271), and the discovery is of scientific rather than economic interest.

TOBACCO. The cigar-leaf tobacco crop of the United States in 1901 was below the average of recent years, and as a whole was unusually variable in quality. For the first time in many years, Pennsylvania produced a larger amount of merchantable cigar leaf than any other State, and the product was unusually fine, as it was in the New England States and in New York. In Ohio and Wisconsin the prolonged drought severely damaged the crop and reduced the area harvested. In Florida and Georgia the season was reported as only fairly favorable. The estimates for the cigar-leaf crop, as published by the *American Agriculturist*, are as follows:

Acres and Production of Cigar-Leaf Tobacco in United States.

	Acreage.		Production (In cases of 850 lbs. each).	
	1901.—Acres.	1900.—Acres.	1901.—Cases.	1900.—Cases.
Ohio	35,000	42,275	70,000	97,836
Wisconsin	25,000	31,778	57,143	127,112
Pennsylvania	22,050	24,850	94,500	71,000
New England States	16,427	14,321	89,175	73,274
New York	7,295	7,800	30,222	32,400
Southern States	2,600	2,400	5,943	6,053
Total	108,372	123,424	346,983	407,675

Statistics for other kinds of tobacco are lacking. The Department of Agriculture has reported that the yield per acre in Kentucky, Virginia, North Carolina, Tennessee, and Maryland was above the ten-year averages. The total production of manufactured tobaccos during 1901, is summarized by the *Tobacco Leaf*, as follows, in comparison with the previous year:

	1901. Number.	1900. Number.
Cigars @ \$3.60.....	2,817,396,531	5,534,666,918
Cigars @ \$3.00.....	3,071,925,611	.....
Cigars @ \$1.00.....	358,265,570	618,811,750
Cigars @ \$0.54.....	391,363,814	.....
Cigarettes @ \$1.50.....	998,292,308	2,576,554,208
Cigarettes @ \$1.08.....	1,238,244,831	.....
Cigarettes @ \$0.54.....	169,788,333	.....
Cigarettes @ \$3.60.....	6,964,493	4,972,323
	Pounds.	Pounds.
Tobacco @ 12 cents.....	155,894,683	281,785,078
Tobacco @ 9.6 cents.....	136,353,677	.....
Snuff @ 12 cents.....	9,612,355	13,616,509
Snuff @ 9.6 cents.....	7,468,886	.....

All branches of tobacco manufactures show an increase, except cigarettes, in which there is a decline of something over 168,000,000, as compared with 1900.

The exports of tobacco during the calendar year 1901, as computed by the *Tobacco Leaf* from the returns of the Treasury Department, were as follows:

EXPORTS OF DOMESTIC AND "FOREIGN" TOBACCOS AND THEIR PRODUCTS, 1901.

DOMESTIC TOBACCO.			"FOREIGN" TOBACCO.		
	Amount.	Value.		Amount.	Value.
Leaf.....(lbs.)	299,144,397	\$26,646,655	Leaf suitable for cigar wrappers.....(lbs.)	998,999	\$ 842,526
Stems and trimmings (lbs.)	9,599,296	214,477	Other.....(lbs.)	1,106,482	455,060
Total.....(lbs.)	308,743,693	\$26,861,132	Total.....(lbs.)	2,675,481	\$1,297,586
Cigars.....(M)	2,014	\$ 48,395	Cigars.....(M)	18,720	\$ 32,522
Cigarettes.....(M)	1,226,897	2,082,994	Cigarettes & cheroots.....(M)	.....	4,773
Ping.....(lbs.)	12,169,318	2,584,464	All other.....	.....	.....
All others.....	.....	661,836	Total.....	.....	\$ 37,296
Total.....	.....	\$ 5,377,189			

These exports went mainly to United Kingdom, Italy, Germany, France, Belgium, Netherlands, and Canada, in the order named. The imports for the year 1901, obtained from the same source, were as follows:

IMPORTS OF TOBACCO AND ITS PRODUCTS, 1901.

	Amount.	Value.
Leaf suitable for cigar wrappers.....(lbs.)	6,269,994	\$ 5,831,964
Other.....	21,766,466	10,366,446
Total.....	28,016,460	\$16,198,399
Cigars, cigarettes, and cheroots.....(M)	476,776	\$ 2,504,414
Others.....	.....	86,616
Total.....	.....	\$ 2,590,030

These imports came principally from Cuba, Netherlands (Sumatra), and Turkey, and were of the higher grades of tobacco, as their values indicate. The Sumatra leaf is essentially a wrapper leaf which has been highly developed in the past few years.

TOBAGO. See TRINIDAD.

TOGOLAND, a German colony in West Africa, with a coast line 32 miles long on the Gulf of Guinea, between the Gold coast and Dahomey. Inland the country broadens out and is bounded on the north by the French military territories. The area is estimated at 33,000 miles and the population at 2,500,000; of these 114 are Europeans. The colony is administered by an imperial commissioner assisted by a

local council of merchants. The capital is Lome. The revenue for 1900-01 was 750,000 marks, including a contribution from the imperial government of 270,000 marks. The imports in 1899 amounted to 3,279,708 marks and included mainly cotton, spirits, tobacco, wood, and iron. The exports, which amounted in 1899 to 2,582,700 marks, are mainly rubber, palm-oil, and palm kernels, ivory, and copra. The wealth of the province is in forests and live stock. Communication with the interior is conducted with ox-carts. There are post-offices at Little Popo, Lome, and other towns on the coast, and these cities are interconnected by telegraph lines, which extend also to the Gold Coast and to Dahomey. The delimitation of the northern spheres of influence between the Gold Coast and Togoland is in dispute. A mixed commission of Germans and English which met at Berlin about the end of 1900 to decide this question was unable to agree upon terms.

TOJETTI, VIRGILIO, artist, died in New York City, March 27, 1901. He was the son of Chevalier Domenico Tojetti, a celebrated Italian artist employed by Pope Pius IX. to restore some of the Vatican paintings, and was born in Rome, March 15, 1851. He studied first in his father's studio and later at Paris under Bouguereau and Gérôme, after which he came to America and eventually settled in New York City. As a frequent exhibitor at the Academy of Design there, his pictures became well known. Some of them are, "The Two Roses," "Galatea," "Sweet Thoughts," and "The Burst of Melody." He was known also as a mural decorator, and was engaged in this capacity for many public buildings and private residences.

TOLSTOY, LEO (LYOFF or LYEFF) NIKOLÁYEVICH, Count, Russian novelist and social theorist, by a decree of the Holy Synod of the Orthodox Church, in March, 1901, was excommunicated by that body. In April, Tolstoy replied, in an open letter to those "in authority," to the formal charge that by his theories he had cut himself off from Christianity. The letter, by recognizing the power of the Czar and the government to make certain indicated changes in the social condition of the Russian peasantry, was generally regarded by his admirers as a compromise. Four specific reforms were demanded by Tolstoy—equal political rights for the peasant working classes, the abolition of martial law in villages, the promotion of general education, and the abolition of all religious restraint. Following the publication of this reply, threats of banishment were made by the synod, but no official action was taken.

TONQUIN, the northernmost division of the French colony of Indo-China, is located on the Gulf of Tonquin between China, on the north, and Anam, of which it was formerly a dependency, on the south. It has an estimated area of 119,660 square miles and a population estimated at 12,000,000. Of the inhabitants, about 400,000 are Roman Catholics. The capital is Hanoi, with 150,000 inhabitants. Tonquin was formerly a vice-royalty of Anam, but since 1897 the government has been in the hands of a French resident. The local budget of the colony balanced in 1900 at 4,072,200 piastres, and the expenditure of France (budget of 1901) was 485,000 francs. The imports, chief of which were metals, tools and machinery, and textiles, amounted in 1900 to about 25,000,000 francs, and the exports, principally rice and animal products, to about 20,000,000 francs. Railway construction is progressing rapidly; a line from Haiphong, on the coast, to Lao-Kay, on the Chinese boundary, 239 miles distant, was opened in 1901. See **INDO-CHINA**.

TOPAZ. See **GEMS**.

TRADE UNIONS. The membership of labor organizations in the principal industrial countries of the world is as follows:

	Membership.
Great Britain, end of 1900.....	1,905,116
United States and Canada, 1900.....	1,600,000
Germany, end of 1900.....	995,435
France, end of 1900.....	588,832
Austria, end of 1899.....	157,773
Denmark, January 1, 1900.....	96,359
Hungary, 1899.....	64,000
Sweden, January 1, 1899.....	58,340
Switzerland, 1899.....	49,034
Spain, October, 1901.....	31,558

The membership of United States trade unions, reported by the Industrial Commission on July 1, 1901, is as follows:

	Membership.
Unions affiliated with the American Federation of Labor.....	950,000
Custom-clothing makers.....	3,800
Lithographers.....	2,100
Bricklayers.....	39,000

	Membership.
Plasterers	7,000
Stone-cutters	10,000
Box-makers	5,500
Piano-workers	7,700
Engineers, marine.....	6,000
Engineers, locomotive.....	37,000
Firemen, locomotive.....	39,000
Conductors, railway.....	25,800
Trainmen, railroad.....	46,000
Switchmen	15,000
Letter carriers	15,000
Knights of Labor and unenumerated organizations, say.....	191,100

In England, during 1900, the membership of all trade unions rose 104,247, or 5.8 per cent. over the previous year, a greater percentage of increase than in any average year of the period 1892-1899. The increase in 1900 was mainly due to the increase in the membership of the coal miners' unions. The income of 100 principal unions in Great Britain in 1900 amounted to £1,975,000, and their expenditures to £1,491,000. The accumulated funds of the societies stood at £3,767,000. The greater part of the disbursements of British labor unions are for friendly benefits, such as payments to unemployed, sick, or superannuated members, funeral expenses, etc. From 1892 to 1900 inclusive, £13,500,000 were disbursed by 100 principal unions. Of this amount more than £8,000,000, or 60.3 per cent. has been on account of "friendly benefits," £2,750,000, or 20.2 per cent. on strike benefits, and the remainder on working expenses. Out of 1,905,116 members of trade unions, 122,047, or 6½ per cent., were women. French trade unions in 1900 gained 100,000 over 1899. Out of a total membership of 588,852, 152,041, or 25.8 per cent. were included under transportation and warehousing. The number of female members at the end of 1900 was 32,065. The development of trade unions in Germany during the past few years has been unusually rapid. In 1900 the increase over 1899 amounted to 15.2 per cent. The total number of trade unionists in Germany in 1900 was 995,435, divided among the different affiliations as follows: Social Democratic unions, 690,287; Hirsch Duncker trade unions, 91,661; Christian trade unions, 159,770; independent labor unions, 53,717. Of these organizations, in 1900, 58 were national, with a membership of 680,427, including, however, only 15 per cent. of all workers in identical trades. The German unions spend much more on strike benefits than do the British unions. During the period 1891-1900, out of a total expenditure of 38,737,594 marks, 11,688,763 marks were spent for benefits, and 9,237,637 for strikes, or 29.9 per cent. for benefits as compared with 60.3 per cent. expended for this purpose by the British unions. American and English trade unions have up to the present time kept out of politics, and the American Federation of Labor has again explicitly repudiated a policy of independent political action. It is of interest, therefore, to observe that the English unions are seeking to unite with the Socialists. Peter Curran in the September (1901) *International Socialist Review* gives an account of the project. In England, there are at present two active propagandist socialistic organizations, the Independent Labor Party and the Social Democratic Federation. At the Trades Union Congress in 1900, a collectivist resolution was passed which has resulted in the formation of a joint labor representative committee to control the rates of the socialist organization and 350,000 trade unionists. Candidates brought forward by either wing of the alliance, who are known to be friendly to the policy of independent political action and the formation of a labor party in the House of Commons are indorsed by the committee, and receive the support of both wings of this organization. It is expected that by means of this organization a parliamentary labor group will be formed, the allies having captured two seats in the last election.

The steel strike of 1901 brought to the fore among others, two questions of great practical importance in framing public opinion upon the subject of unionism: (1) The limitation of production by the unions, and (2) the one-sided nature of agreements between employers and labor organizations. A recent report of the Industrial Commission on trade and labor organizations discusses the policy of limiting output as follows: "There has always been a strong tendency among labor organizations to discourage exertion beyond a certain limit. This tendency does not always express itself in formal rules. On the contrary, it appears chiefly in the silent, or at least formal, pressure of working-class opinion. It is occasionally embodied in rules which distinctly forbid the accomplishment of more than a fixed amount of work in a given time; . . . Examples of this limitation of output are found in the Flint Glass Workers' Union; the Stove Mounters' Union, of Detroit, which does not permit its members to earn more than \$4.50 per day; the Amalgamated Association of Iron, Steel, and Tin Workers, which fixes a maximum charge for a boiling furnace and a minimum time for a heat; and in the general policy of a large number

of unions, for example, the Machinists' Union, in prohibiting piece work to their members. This policy has met with the strongest disapproval from employers. Thus President Schwab, before the Industrial Commission, expressed himself as follows: " . . . If I were to-day a workman, as I was in one of those mills, especially, if managed under the broad policy that governs steel manufacture, I would not want to belong to a labor organization. It puts all men, no matter what their ability, on the same level. If I were a better workman, quicker, smarter than the other men, I would want to reap the benefit. I would not want to be put in the same class with the poorer men. If we have 500 men employed at the same class of labor the union requires that the wages paid must be the same and the level is that of the poorest man in that department." This point of view received much support from British testimony during 1901. Mr. Benjamin West, of the *Glasgow Herald*, writing in the *North American Review*, said: "In practice, the British trade union is an organization for the restraint of labor and the manacng of capital. The modern trade union is a combination for the sole purpose of furthering the supposed interests of the workmen without regard to the interests of the trade or craft as a whole. If Great Britain fails in the industrial race, it will not be because her workmen cannot create as well as others, but that they will not. A German or American workman will give equal attention simultaneously to three, four, or six machines or tools, whilst the British workman is compelled by his trade-union to limit his attention to one, so that employment may be given to half a dozen other men who ought to be busy elsewhere." There is, however, something to be said on the other side. Thus the Industrial Commission: "Under a piece-work system, the men are automatically induced, by their eagerness to earn the highest possible wage, to work with all their energy through every hour of the working day. If the tendency is unrestrained, the ultimate result is, say the workmen, that the piece price is reduced as the output increases, till the most skillful, working their best, can just make good wages." It is also pointed out that collective bargaining is impossible if one man offers more work for a given wage than another. It is coming to be believed, however, that a better means of limiting the supply of labor is by shortening the working day. "The diminution of the number of hours which a man spends in daily toil is an object which appeals to men of all classes as not only justifiable, but admirable and socially beneficial." Trade unionism, during the steel strike, also laid itself open to attack in the matter of contract breaking. The tin-plate workers and some of the employees of the Federal Steel Company, although they had signed agreements with the companies to work during the ensuing year, with the advice and countenance of the general officers, went on strike, thus breaking their contracts. This action was generally taken as an example of a marked weakness in trade-union organization. The *Commercial and Financial Chronicle* of August 3, 1901, voices the capitalistic point of view as follows: "Combinations of capital are subject to the restraints of law. They can be estopped from any action menacing the public welfare, and both in this regard and in the matter of observance of formal contracts they may be held by their property interests, upon which the courts may impose such penalty as is right. These restraints could not hold in the case of what has been called a 'labor trust.' A union effects its purposes by directing its members to stop work. They are supposed to obey such instructions voluntarily, and there is no way in which the courts can prevent their doing so. How some of them look on the observance of written contracts readers of recent strike news are sufficiently well aware. Civil action against the union is possible for such contract violations; but as the union holds no property, or at best a small trust fund deposited in bank, the threat of recovering damages has no terror for it." An escape from the situation here indicated as offered by a plan frequently suggested during 1901, that the trade unions should themselves become incorporated and thus be placed on the same footing as the employer. Mr. Carroll D. Wright has presented the affirmative side of this proposition in the *Outlook*. Under the general laws of the different States relating to corporations of all kinds, business, educational, religious, or benevolent, trade unions can easily secure a charter. Iowa, Louisiana, Maryland, New York, Ohio, Pennsylvania, and Wyoming make special mention of trade unions in their statutes relating to incorporation. The United States, by acts of 1885 and 1886, provides for the incorporation of national unions having headquarters in Washington. The advantages of incorporation are that the union thus becomes a person in the eyes of the law. It would have standing in the courts, could enforce contracts against employers, and would have a better standing in public opinion. To this it may be answered, that all these advantages except the last mentioned are now enjoyed by the trade union, by the initiative of individual members, any one of whom can under the common law bring an action against his employer for breach of contract or violation of law to the prejudice of the employee. It is, moreover, argued, that the union if incorporated would be far more subject to judicial interference than at present, and this, in view of a natural prejudice of the courts in favor of the conservation of prop-

erty, it is, in the judgment of most labor leaders, advisable to avoid. Violation of an injunction now acts only upon the individual. When the violator was a member of a union, however, and could show that he acted under the rules of the union, the union might be declared to have forfeited its charter. The power of a union to control its own members would also be seriously impaired by incorporation. A member suspended or expelled for any offense, might bring the whole union into court. It is also urged that the present tendency of union government is away from centralization, and in the direction of democracy. Incorporation, however, must necessarily result in greater centralization. It is also urged against the plan of incorporation that the amount of property at the disposal of even the wealthiest union is insufficient to place it on an equality of liability with its employers. This difficulty might be obviated by making members individually responsible. In certain states of Australia and in New Zealand, for example, recent legislation has permitted unions to enter into binding agreements with employers, which may be enforced against them by fine upon the union, individual members being also liable to a limited extent. There is a disposition in some quarters to enforce joint responsibility upon unions even though they are unincorporated. In the United States, unincorporated unions have been sued before the courts and they are frequently named in injunctions. A recent decision of the British House of Lords held that the funds of a union even though unincorporated may be levied upon to collect damages for injuries inflicted upon an employer by an unlawful act. This decision has not strengthened the argument of the advocates of incorporation. The question has just been opened in the United States; but from present appearances, if left to the unions, it will be decided in the negative. See ARBITRATION, LABOR; FEDERATION OF LABOR, AMERICAN; STRIKES; and UNION LABEL.

TRAFTON, MARK, Methodist Episcopal clergyman, died at Somerville, Mass., March 8, 1901. He was born at Bangor, Me., August 1, 1810, and in boyhood was apprenticed to a shoemaker, but left this occupation to preach. He received no seminary education in theology, but as a Methodist minister conducted successful charges in different New England States and at Albany, N. Y. He sat in Congress, 1855-57, as a Know-Nothing from Massachusetts, gaining prominence there by his antislavery agitation, and was a delegate to the Peace Congress at Frankfort, Germany, in 1850. He was also noted for his oratorical ability and temperance work and as an author, some of his works being: *Safe Investment*; *Baptism*; *Rambles in Europe*; *Scenes in My Life*; and *The Birch Canoe* (poem).

TRANS-ANDEAN RAILWAY. See CHILE (paragraph Communications).

TRANS-SIBERIAN RAILWAY. See RUSSIA (paragraph Communications).

TRANSVAAL, THE, formerly the South African Republic and now the Vaal River Colony of the British crown, is situated on a plateau in the interior of South Africa between the Limpopo and the Vaal Rivers. Its area is estimated at 119,139 square miles, and its population was placed in 1898 at 1,094,156, of whom the number of Englishmen was close to 200,000. The largest towns are Johannesburg and Pretoria. The population of the former at the beginning of the war was over 100,000, but at present is probably not more than one-fifth of that number. Pretoria, the capital, had in 1900 a population of 12,000. The leading religious denominations in 1898 were the Dutch Reformed Church, Independent Dutch Churches, and the Anglicans, each with about 30,000 adherents. Education, in 1897, was provided for by about 425 government elementary schools, a gymnasium and a high school, in addition to private institutions and denominational schools. In 1901 the work of public instruction was carried on only to a very limited extent in Johannesburg, Pretoria, and one or two of the other leading towns.

Government, Justice, and Finance.—Up to October 25, 1900, the Transvaal was a republic under a constitution framed in 1849. The legislative power was vested in two bodies of 27 members each, known as the First and Second Volksraad. The president in 1900 was S. J. P. Kruger. As the Vaal River Colony, the Transvaal is at present under the authority of the high commissioner for South Africa, Lord Alfred Milner, who is governor of the two Boer states. In 1901 the colony was still under military law; but in the principal towns municipal governments had been set up, consisting of town councils and mayors, nominated by the governor of the colony. Civil courts of justice were established in a number of the principal towns, and minor tribunals in all districts completely under British control. At Pretoria and Johannesburg criminal courts were erected. Revenue, which in the days of the republic had been derived from import duties, the railways, and mining licenses, practically disappeared with the disappearance of commerce, the cessation of mining, and the occupation of the railways by the military authorities. In 1901, however, sufficient revenue was collected to defray the expense of such civil government as was in operation.

Industries.—Though the soil of the Transvaal is well adapted for agriculture, it was estimated in 1898 that only 50,000 acres, or about one-fifteenth of one per cent. of

the surface of the colony, were under cultivation. Gold mining is the great industry; the only industry in fact on which the strength of the former Boer government was based, and upon which the British hope to erect a new framework of government. In 1898 the value of the gold output was £16,044,135, or more than one-fourth the entire production of the world. In 1899 the yield for eleven months (war broke out early in October) was estimated at more than £14,000,000. In 1900 mining came practically to a standstill, the white inhabitants deserted the Rand, and the only work done was that accomplished by "cape boys," or Kaffirs, under the direction of the Transvaal government; a sufficient quantity of ore being mined to pay for military supplies purchased abroad by the Boer republics. In 1901 there was a considerable influx of miners and a number of establishments recommenced operations; but the full resumption of mining was prevented by the military activity of the Boers. Large quantities of valuable machinery were destroyed, and many of the gold seekers frightened into abandoning the fields. Coal and diamonds are also mined in the Transvaal. In 1898 the production of coal amounted to 1,950,000 tons. The value of the diamond output in the same year was over £41,000. The chief imports are machinery, animals, textiles, hardware, flour and grain, timber, leather goods, and railroad material. The principal exports are gold, wool, cattle, hides, ostrich feathers, and ivory. In 1898 the total imports were valued at £10,632,893, while the exports were nearly £14,000,000. There are no satisfactory figures for subsequent years; but a comparison of the imports into the Transvaal through Cape Colony for the fiscal years ending July 1, 1899 and 1900 shows a decline from £3,380,349 to £737,356, or a little over one-fifth. During the first six months of the fiscal year ending in 1900, namely, from July 1 to December 1, 1899, there were no imports through Cape Colony. This was the period when the Boer invasion threatened Cape Colony itself. The decline for the two years was fairly uniform throughout the principal list of commodities; machinery dropped from £793,231 to £188,406; clothing from £204,641 to £36,436; cotton textiles from £214,874 to £37,273; chemicals from £153,957 to £22,193; provisions from £66,226 to £15,941. The revival of trade, which was predicted for 1901, did not come about. The recrudescence of Boer activity checked immigration into the Transvaal, and with immigration, commerce. At Cape Town and other ports large stocks of merchandise and raw materials had been gathered in expectation of the complete pacification of the country; but by the end of 1901 only a very small part of such wares had been sent forward. In September, 1898, there were 774 miles of railway in the Transvaal, with 270 miles under construction and 252 miles projected.

HISTORY.

Summary.—Organized resistance on the part of the Boers had come to an end in the fall of 1900, as a result of the operations of Lord Roberts against the forces under Botha in the northeastern Transvaal. After that the struggle on the part of the Afrikaners degenerated into a spasmodic partisan warfare, which seemed to promise the speedy termination of the conflict. During the last six weeks of 1900, however, the Boers under De Wet, Delarey, and Steyn burst into startling activity and at the very end of the year not only were the British troops busily engaged in the Transvaal and the Orange River Colony, but Cape Colony itself was invaded by a number of Boer commandos and witnessed some of the severest fighting of the year 1901. In general the war on the part of the Boers was nothing more than a series of guerrilla raids carried out by small numbers of men who acted independently, it would seem; but who, owing to their great mobility, showed themselves able at times to unite into larger bands for the purpose of threatening some strategic point or cutting some important line of communication. In the Transvaal and the Orange River Colony small posts were repeatedly attacked, and isolated groups of scouts or mounted infantry taken. The main object of the Boer campaign was evidently to destroy the chain of fortifications and military posts with which the British were attempting to inclose the pacified districts of the country. In Cape Colony their activity was all the more formidable in that they undoubtedly possessed the sympathy of a large part of the population, upon whom they could depend for subsistence and information, if not for active aid. On the part of the British the war resolved itself into an attempt to hold in subjection such parts of the former Boer republics as had been pacified, and gradually to extend the area of British control. By the beginning of April, 1901, the British had discovered the futility of taking the field with large bodies of men incumbered with heavy artillery. Accordingly there was adopted during the year a plan of campaign much more suitable to the nature of the country and the tactics of the enemy. (1) By the so-called "block-house plan" Lord Kitchener hoped to surround a large extent of territory from which the guerrilla bands of the enemy should be absolutely excluded. The railways were taken as the framework upon which the system of blockhouses was built up. At an interval of 3,000 yards along the entire stretch of railway line in the two Boer colonies small guard houses of sheet iron were erected, between the posts a constant patrol was

maintained, and such weak spots as might afford the enemy an opportunity for crossing the line were strengthened by means of barbed-wire fences. In this manner it was reported officially that in November, 1901, an area of 14,700 square miles in the Transvaal and 17,000 square miles in the Orange River Colony was inclosed. (2) An important feature in the plan of pacification was the division of the country into three zones, setting out from the principal towns as a centre, under the protection respectively of the civil authorities, the mounted police, and, finally, the regular field forces. The country for fifteen miles around Bloemfontein, for instance, was considered thoroughly pacified and standing in no need of further protection than that afforded by the municipal authorities. This circle was surrounded by a larger zone which, in the case of Bloemfontein, embraced the triangle formed by Kaffir River Station, Glen Station, and Petrusburg. This area was patrolled by the South African constabulary. Inclosing these two belts was a third region embracing the entire extent of the field of operations and traversed by the British detachments, for by the end of spring movements in mass had been abandoned and the British forces in South Africa, estimated at 200,000 men, were split up into as many as sixty columns. (3) To keep in subjection those Boers who had surrendered and taken the oath of allegiance, martial law and, in Cape Colony, the law of treason was applied, in some cases, with severity. A number of burghers convicted of treason were shot during the year, and others were banished or condemned to long terms of penal servitude. (4) The final mode of pacification adopted by the British, and one by which it was intended to deprive the Boers of their primal sources of supply was the institution of concentration camps, to which were removed all the women and children of the Boers, and such of the men as the government had cause to fear.

Military Operations in January and February.—Early in January the Boers had planned a simultaneous invasion of Natal and Cape Colony for the purpose, it was presumed, of capturing some seaport, so as to reopen communications with the outside world. On the night of January 7, the Boer forces in the eastern Transvaal, under the command of Botha, Viljoen, and Grobelaar, delivered a series of attacks along the whole line of the Delagoa Bay Railway, at Belfast, Wunderfontein, Wildfontein, Nooitgedacht, and Machadodorp. After severe fighting they were repulsed at all points. Skirmishes took place at the end of the month at Brockpan, where the Boers did some damage, and north of Vryburg, where a small body of police were taken prisoners. On January 23, a train with Lord Kitchener on board, bound for Middleburg, was fired on by the Boers and narrowly escaped capture. Operations were more active in the Orange River Colony, where during January, General Knox was busily engaged in hunting De Wet. The latter, after his unsuccessful attempt in the last part of December, 1900, to force his way into Cape Colony, had retreated northward and in the middle of January was north of the Vaal River, and in close touch with Delarey. On January 30, he was once more in the Orange River Colony and succeeded in crossing the Bloemfontein-Ladybrand line near Israelpoort. Considerable losses were suffered by the British at various points, as at Lindley, on January 6, where forty officers and men were killed and wounded; but in return they were successful in routing large bodies of the enemy, and taking a number of prisoners, as at Naawpoort, on January 5, and near Standerton, on January 17. In the beginning of February, De Wet endeavored once more to break across the Orange River. Setting out from the neighborhood of Thaba Nchu, he made a vain attempt to cross at Bethulie, on February 8; but he succeeded three days later in entering Cape Colony. There he was joined by considerable reinforcements from the commandos under Kritzinger and Herzog, who had invaded the Colony about the middle of December, 1900. The united forces of the Boers were attacked by General Plumer near De Aar, on February 15, and once more on February 23, when they were scattered and the main body under De Wet sent flying north to the Orange River, where he recrossed on February 28, with a heavy loss in men, guns, and cattle. Sporadic bands of Boers remained in Cape Colony and for a long time were more or less active in the neighborhood of Graff Reinet and Prieska.

Negotiations for Peace.—During the latter part of February communications passed between General Botha and Lord Kitchener, regarding the possibility of arriving at some agreement that should terminate hostilities. On February 28 an interview between Kitchener and Botha took place at Middleburg. Before entering into correspondence with the Boer general, Lord Kitchener had stipulated that the subject of the independence of the Boer states should not be broached. General Botha requested a statement of terms which the British government might be inclined to offer, and which he stood ready to communicate to the fugitive Transvaal government. The Boer leader inquired whether Great Britain would be willing to grant that a general amnesty should be proclaimed after the cessation of hostilities, in Cape Colony and Natal, as well as in the Orange River Colony and the Transvaal; (2) that the prisoners in the hands of the British outside of Africa should be restored to their homes; (3) that military occupation should be replaced by a civil administra-

tion; (4) that under the new régime existing property rights should be respected, and the English and Dutch languages taught in the schools and employed in the courts; (5) that the franchise should not be extended to the Kaffirs in the Transvaal or Orange Free State; (6) that the British government should assume the legal debts of the republics. These stipulations Lord Kitchener communicated to Lord Alfred Milner, the high commissioner for South Africa, with the recommendation that they be favorably considered. Lord Milner made the same recommendation to Mr. Joseph Chamberlain, expressing his belief that the demands formed a reasonable basis for the conclusion of peace and the beginning of the task of erecting a civil government in the annexed territories. The secretary for the colonies, however, insisted upon some changes being made in the conditions, not affecting, perhaps, the general character of the terms extended, but indicating the fact that the British government in yielding to the demands of the Boers was acting not under compulsion, but in a spirit of generosity. As finally formulated, the terms offered to General Botha were as follows: Upon the complete cessation of all hostilities the British government promised to proclaim general amnesty for the Transvaal and Orange River colonies and to use its influence to induce the government of Cape Colony and Natal to do the same in the case of citizens who had taken up arms against Great Britain; such British subjects, though not compelled to return to Cape Colony or Natal, would be liable to punishment if they did so of their own free will; the Boer prisoners in Ceylon, St. Helena, and the Bermudas were to be transported to South Africa as soon as possible; military rule was to be replaced by civil government of the type of a British crown colony, in which limited representation and self-government would be allowed the Boers; a high court of justice, independent of the executive, was to be established; the public debt of the republics could not be assumed; but as an act of grace the British government would contribute the sum of £1,000,000 to be distributed *pro rata* among the *bona fide* debtors of the two governments. The Kaffirs, under civil government, were to enjoy the same legal rights as they possessed in Cape Colony; but at no time was the franchise to be so distributed as to endanger white supremacy. The hope of government loans to farmers to assist them in reestablishing themselves on their farms was also held out. On March 16, General Botha informed Lord Kitchener that the nature of the conditions offered would make it impossible for the Transvaal government to accept them, and in a proclamation, which he issued soon after, he pointed out that the terms were in no way more liberal than those the British government could advance in the worst case, that is, in case the Boers were reduced to complete subjection.

The War up to August.—The month of March was characterized by great activity on the part of the Boers in the Orange River Colony, and by severe fighting in the western Transvaal. British columns under General Lyttleton succeeded in clearing the country east of the railway from the Orange River to the Thaba Inchu-Ladybrand line. The Boer forces under Piet Fouri were closely pursued by the British under Bruce Hamilton, Colonel Thorneycroft, and others. At the end of the month the country southeast of Heilbronn was swept clean by the columns under General Williams. The Orange River Colony was divided into four districts, traversed by General Elliott in the north, Hamilton in the south, Rundle in the east, and Knox in the centre. During March, General French operated along the Swaziland and Zululand border, and succeeded in driving the Boers from that region. In the western Transvaal, heavy fighting took place between the British forces under Methuen and the Boers under Delarey. Encounters occurred at Lichtenburg, Geduld, Ventersdorp, and Haartebeestefontein. On March 22, the Boers captured a supply train near Vlaklaagte. From March 23 to 25, Babbington was engaged in a continuous fight with Delarey, which resulted in favor of the British, who took some hundreds of prisoners and captured nine guns and a large number of cattle. The months of April, May, and June were free from any set engagements. There were a number of raids in the Orange River Colony, and there was considerable Boer activity in Cape Colony, where Kritzingen and Herzog, with reinforcements from across the Orange River, succeeded in taking Jamestown, and capturing a large amount of stores. Though constantly pursued and forced to engage in a number of running fights they succeeded in holding their own in the country between the Orange River and Aberdeen. A notable exception, however, to the petty guerrilla raids was the battle at Vlakfontein, forty-five miles southwest of Johannesburg, fought on May 29, when Delarey, with 1,200 Boers, attacked the rear guard of General Dixon in command of the Seventh Yeomanry. The Boers were repulsed with the loss of forty-one dead, but the British casualties amounted to 178, and the moral effect of the engagement made it practically a defeat for the latter. More than a month after the battle, the charge was made by the British, and substantiated by the affidavits of those who had participated in the fighting, that the Boers had been guilty of the shameful act of shooting the wounded and prisoners after the engagement. The same accusation

was made with regard to the battle of Graspan, fought on June 6. The charges were denied by the Boers, and cannot be regarded as absolutely proven; but it would seem to be a fact that late in July, after a skirmish at the Doorn River, in the Orange River Colony, a number of native Kaffir scouts were shot by the Boers. Minor victories were gained by the Boers in June, as on the 12th of the month, when 200 Victorian Mounted Rifles were surprised and taken prisoners at Steenkoolspruit, near Wilmansrust. The character of the warfare carried on by the British is portrayed in the London *Weekly Times* for July 26. British columns are described as moving actively in all directions, with the railway lines from Cape Town to Pretoria as a base of operations. Although in spite of the rapidity of movement on the part of the British, it was found difficult to take any considerable force of Boers so effectually by surprise as to insure their capture in a body, the numbers of the enemy were being steadily reduced by the capture of small detachments all over the field of operations in South Africa. The degree to which the British authorities were at loss in estimating the strength of the Boers in the field is indicated by the various conjectures made during the months of May and July. In the former month the number of belligerents was placed at anywhere from 10,000 down to 2,000; while in July, Lord Kitchener estimated the number of Boers engaged in active operations at 13,500. The difference between these figures might be partially accounted for by the fact that large numbers of burghers participated in the fighting intermittently only, so that a Boer victory would be followed by the appearance of a large number of commandos all over the country, while a setback would cause practically the total dispersion of the Boer forces.

War by Proclamation and Editorial.—On August 7, Lord Kitchener issued a proclamation declaring that all Boer officers taken in arms against Great Britain, after September 15, would be permanently banished from South Africa. Upon the course of the war this proclamation produced no effect, for it was quite natural that men who had been in arms against the British government for nearly two years, and of whom many had laid themselves open to the charge of treason in case of capture, would not in any way be deterred from hostile action by the threat of a contingent exile in an indefinite future. But to the enemies of Great Britain in Europe, Lord Kitchener's action was a source of infinite gratification in that it supplied them with an apparent basis for the charges they had been bringing through press and parliament against the conduct of Great Britain in Africa. German and Russian newspapers dealt with deep indignation upon the ruthless policy which the British authorities had seen fit to adopt, and went so far as to declare that to exile men who were fighting in defense of their liberties and their homes from their native land was carrying war beyond the limits set by the modern standards of humanity. In the Orange River Colony, President Steyn published a counter proclamation rehearsing the entire story of the quarrel from the very beginning and setting forth the conduct of the British in terms of the utmost condemnation. General De Wet also joined in this war by proclamation and issued a manifesto on his part declaring with a sense of humor, seeming strangely in a Boer, that all British soldiers found in South Africa after September 15 would be shot. Practical results, then, there were none following upon Lord Kitchener's proclamation, and the war continued to drag on in a monotonous series of raids and night attacks on the part of the Boers, and in a patient, unceasing chase on the side of the British. If, however, the British failed to gain any decided success, the drag-net policy established by Lord Kitchener seemed to produce satisfactory results. Considering the limited number of Boer belligerents in the field, the steady captures made by the British seemed to promise that within a comparatively short time Boer resistance must collapse from utter exhaustion. Figures issued by the war office showed how serious was this drain on the Boers' strength. For the month of May, Lord Kitchener reported that in killed, wounded, prisoners, and voluntary surrenders, the Boers had lost 2,600 men, and a fairly accurate estimate of what their losses during 1901 were may be derived from a comparison of the weekly figures issued at different parts of the year. Thus, for the week ending August 12, the number of the Boers was decreased by 39 dead, 20 wounded, 685 prisoners, and 85 surrendered, a total of 829; for the week ending September 9, the figures were 681; for the week ending September 23, they were 443; between November 7 and November 18, the loss was 356. In view of the fact, therefore, that the forces of the Boers suffered an average diminution of nearly 600 men per week, through the greater part of the year, the confidence expressed by a large number of Englishmen in the speedy termination of the war appeared to be not wholly unjustified. In the spring of 1901 the distribution of the Boer population of the Orange River Colony, according to the official figures of the British government, was as follows: 42,000 men and women were held as prisoners outside of South Africa, or detained in the concentration camps; the number of killed and wounded during the war was placed at 11,000, and the strength of the men in the field was estimated at 10,000. Of the entire population before the war only about 15,000 were living in the larger towns under British protection.

In May, General Botha requested of the British authorities and obtained permission to communicate by cable with President Kruger as to the advisability of prolonging operations. In June, before an answer was received, a conference took place in which Botha, De Wet, Delarey, President Steyn, and vice-President Schalkburger, representing the so-called Transvaal government, participated. It was decided after long consideration, to continue hostilities until independence had been secured. On July 5, there came a reply from Kruger, in brief and Biblical phraseology, commanding them to keep on fighting.

The Concentration Camps.—The guerrilla method of campaign followed by the Boers had led, as has already been indicated, to a radical change in the system of warfare carried on by the British, the substitution, namely, of lightly equipped, flying columns for the systematic advances of heavy masses of troops. The plan had proven successful in that it put the British on terms of greater equality with the Boers. A second expedient on the part of the British authorities was the establishing of concentration camps, located at a number of points in Cape Colony, the Orange River Colony, and the Transvaal. The inhabitants of the camps comprised various elements. There were, in the first place, those who had come there voluntarily, in order to find protection. The people of this class were referred to by the British press and its sympathizers as the "loyalist element," and were most frequently styled "refugees." As a rule they brought their personal effects with them and were entirely self-supporting. A second class comprised those who had likewise sought protection under the British flag, but who, on account of needy circumstances, were dependent upon the bounty of the government. The third and largest class was made up of women and small children whose husbands and fathers were in the field against Great Britain. These were brought in for military reasons, the argument being that as long as they were permitted to remain in their homes, they rendered effective aid to the enemy by affording them shelter in case of attack, and by supplying them with food and ammunition, and information concerning the movements of the British forces. The system of concentration camps was first brought to the general attention of the British public by Miss Emily Hobhouse, who early in the year had gone as a representative of a London committee to investigate conditions in the South African camps. With the permission of Lord Kitchener, and under the guidance of British officials, Miss Hobhouse inspected a number of camps, and upon her return to England, published the result of her observations. Her report, though showing no especial bias against the British authorities, revealed what was admitted on all hands to be a fearful state of affairs. Miss Hobhouse dwelt, to some extent, upon various evils which may be regarded as inevitable under conditions where thousands of people, under the stress of military necessity, were herded together in places entirely unfitted for such purposes; but the most prominent feature in her account, the one which seems to have impressed her most, and which certainly did move the feelings of the public most, was the sufferings of the children in the concentration camps and of the awful mortality which prevailed among them.

There were not wanting almost immediate responses to the statement of Miss Hobhouse, in which the necessity of the system of concentration camps was pointed out, and the spirit and efficiency of the British authorities were defended. Objections were taken to many of her assertions, but no attempt was made to disprove the truth of her statements concerning the ravages of disease and death among the infant population of the camps, which, in fact, were confirmed by the official figures, issued from month to month from the war office. These figures, dry in themselves, depict clearly enough the true state of affairs. In June, 1901, the white inhabitants of the concentration camps in Cape Colony, Natal, the Orange River Colony, and the Transvaal numbered 14,624 men, 17,711 women, and 43,075 children; the number of natives, at the same time, was 2,327 men, 8,115 women, and 13,057 children, giving a total of 91,909. The proportion of race and age continued fairly uniform through the year, but the total number of inmates increased rapidly from June to October. In July, the figures stood at 118,407; in August, they rose to 137,619, and in September the number was 147,467. According to Miss Hobhouse's statement, the rate of mortality among the children in the camps averaged as high as 117 per thousand. The official figures in June, which showed 1,353 deaths among 66,504 children, indicated a rate of about 240 per thousand. In August the number of deaths was 2,345, or nearly 400 per thousand. In September the deaths were 2,712, with a maximum death rate of 433 per thousand.

Since it was impossible to deny the truth of these figures, or to escape the obvious deduction from them, the supporters of the British policy in South Africa resorted to palliation rather than to denial. The sufferings of the loyalist refugees were balanced against those of the Boer women and children, and even for the latter, it was pointed out, the camps contained lesser evils than would result from the only alternative left to the British authorities—an alternative to which recourse had been had during the year—the burning of the Boer farms. Considering the fact that cer-

tain starvation would have come upon the wives and the children of the Boers if left to themselves with all their means of subsistence gone, it was rather an act of mercy on the part of the British government to bring them where they might be sure of shelter and food. With respect to the high rate of mortality prevailing in the camps, and especially among the children, the argument was that the fault lay for the most part with the Boers themselves, to whose unclean habits, harmless enough in the dry air and vast free spaces of the veldt, but inevitably injurious where people were brought together within narrow limits, the ravages of disease were due in the largest measure. Numerous cases were cited of Boer women who refused, with stupid obstinacy, to follow the directions of the physicians and nurses in the care of their children, and instances were not wanting of babies in great need of careful treatment being fed by their mothers on a diet of cow's dung strained in water, a very common remedy among the Boer women, partaking almost of the character of a universal panacea. In addition, severe epidemics of measles had broken out among the children, and had spread in spite of the efforts of the physicians and trained nurses in attendance.

Such in general were the answers advanced in partial extenuation of the state of affairs as described by Miss Hobhouse. To prove that in many other cases conditions had been greatly exaggerated, committees of women were formed all over South Africa for the purpose of inspecting the camps, and their reports as published in the British press tended to indicate that the system had its good features as well as its bad. Committees, for instance, visited the camps at Fort Elizabeth and Queens-town in Cape Colony, at Bloemfontein and Heilbronn in the Orange River Colony, and at Kimberley, across the border in Bechuanaland. The inhabitants, the reports showed, were supplied with one-half pound of meat and flour per day, special dairies being established for the children. The refugees were mostly lodged in tents or marquees, except at Bloemfontein, where iron structures were put up for their accommodation. Those who had money could buy a number of conveniences or even luxuries, and all the inmates of the camp were at liberty to visit the neighboring towns as often as they pleased.

To the anti-British press in Europe, which found in Lord Kitchener's proclamation an excuse for indulging in bitter tirades against Great Britain, the discussion aroused by the concentration camps afforded a still more favorable opportunity for vituperative criticism. The most influential organs on the Continent seemed to be carried away in a surge of popular hatred for Great Britain and its policy in South Africa. The *Deutsche Zeitung*, the *Kreuz Zeitung*, the *Vienna Vaterland* and *Lokal-Anseiger* and the Russian *Novoye Vremya* indulged in many editorials concerning British barbarities, and published harrowing reports of the outrages committed by the British soldiers on Boer prisoners and Boer women. This attack met with a vehement response in Great Britain, where it was pointed out with much force and feeling, not only by the newspapers, but by so eminent a statesman as Mr. Chamberlain, that the very nations which were so forward in denouncing British tyranny in South Africa had been guilty of far more reprehensible conduct, as was the case with Austria in Bosnia and Herzegovina, and with Russia in Poland. A writer in the *London Times*, under the heading of "Barbarity in 1901 versus Barbarity in 1870," depicted the methods pursued by the Germans during the Franco-Prussian war, and showed that many of the measures then adopted to secure the pacification of a conquered country exceeded in severity anything ever attempted by Great Britain in South Africa.

Military Operations to the End of the Year.—From August to the latter part of December collisions between the Boers and the British, ranging in importance from midnight attacks on isolated military posts to hard fought battles between considerable forces of men, occurred over the entire field of operations in South Africa. A number of General French's scouts were taken on August 16 in Cape Colony, while ten days later at Koorkopje, on the road from Kimberley to Griqualand, a British convoy was cut up with a loss of nine men killed and twenty-four wounded. In the western Transvaal, early in September, a running fight lasting two days took place between Delarey and Methuen, in the Great Maries valley, and the British lost twenty-five dead and thirty wounded. A serious reverse, too, was that of September 17, when General Botha, at Scheepers Nek, near the Natal border, ambushed three companies of mounted infantry under Major Gough, inflicting a loss of seven officers and thirty-nine men, and capturing 155 men and two guns. Three days later another company of mounted infantry fell into the hands of the Boers at Vlakfontein; but, as an offset, a concerted Boer movement upon the Natal frontier, which seemed to look to the invasion of that colony, failed entirely, and the forces of Botha were repulsed at Forts Itala and Prospect, on September 27. Botha's army was dispersed and the general himself sought refuge in the forest of Pongola. On September 29, Delarey attacked Colonel Kekewich's camp at Moedwill. The British lost 161 men in killed, wounded and missing, but drove the Boers back. British suc-

cesses in the latter part of September and the first part of October were the capture of two Boer commandos near Adenburgh, and the taking of Commandant Scheeper, together with eighteen other leaders, who were permanently banished from Africa. In Cape Colony there was great unrest during October. Many burghers joined the Boer forces, and on October 17 a commando of 500 men reached the sea at a point sixty miles northwest of Cape Town. At the latter place there was considerable alarm and the town guard was called out for active service. A week previously martial law had been established over the entire colony. At the end of October, the three main Boer bodies were those commanded by Botha, in the eastern Transvaal, by Delarey and Kemp, in the Magaliesburg district, and by Steyn and De Wet near Bethlehem, in the Orange River Colony. The severest engagement of the year was fought from October 29 to November 1, between the forces of General Botha and Colonel Benson, at Brakenlaagte. The British loss amounted to sixty-one killed and 173 wounded; while the Boer casualties stood at forty-four killed and about 100 wounded. At the same date there was a battle going on between Kemp and the British at Zeerust, which resulted in a loss for the Boers of about forty killed and double that number for the British. During November and December the fighting became once more straggling in character. The capture by the British of 250 Boers on December 5, and of 131 Boers on December 11, showed that the so-called campaign of attrition was still continuing. All through November and well into December, the Boers were fairly active in Cape Colony and north of the Orange River. The railroad between Cape Colony and Kimberley was crossed and recrossed repeatedly by commandos and desultory skirmishes took place at Barkly East, Burghersdorp, and Aliwal North. It was estimated that in November there were 1,500 Boers in the western districts of Cape Colony, and that opposed to them there were British forces numbering more than 18,000 men. In the Orange River Colony there were thirty-one commandos in the field; in the Transvaal the number of Boers was placed at 2,700, divided into eighteen commandos. At the end of the year, therefore, the total strength of Boers in the field was approximately 8,000 busily engaged in monopolizing the entire attention of more than 180,000 British troops. Towards the end of the year the official figures for British losses in South Africa since the beginning of the war were 855 officers and 16,989 men dead, and 2,504 officers and 57,136 men invalided.

Empire Building.—Though the end of the war seemed a quite distant prospect in the early part of 1901, there were not wanting statesmen in England who were absorbed in formulating plans for the reconstruction of South Africa. The popularly accepted views of what should be the proper policy of Great Britain looked toward the organization of a great federal state, to be ruled by a viceroy and a federal council. As delineated with some detail by Sir Henry Drummond Wolff in the London *Times*, this federal council was to be in character partly nominative and partly elective, with a veto upon the local legislatures in all matters pertaining to the common welfare. The most serious problem to be confronted in the creation of such a state was the necessity of retaining the preponderant power in the hands of the loyal element among the population. In the solution of this problem some delicate constitutional questions as to the distribution of the franchise and the apportionment of representation in the federal parliament were bound to arise. In general it was recognized that the Boers of the conquered republics could be brought in the end loyally to support a government established under the British auspices; but that until such a time as the reconciliation became perfect it was necessary to render any effectual resistance on their part either in the field or in Parliament impossible.

TRENHOLM, WILLIAM LEE, former comptroller of the currency, died in New York City, January 11, 1901. He was born at Charleston, S. C., February 3, 1836, and graduated at South Carolina College in 1855. He served in the Confederate army throughout the Civil War as colonel of the Rutledge Mounted Riflemen, an organization raised and equipped by himself and his father. President Cleveland made him a United States civil-service commissioner in 1885, and one year later comptroller of the currency, which office he filled until 1889. During his incumbency Comptroller Trenholm advocated with vigor the withdrawal of all greenbacks from circulation and the increase of bank-notes to replace them. He wrote *The People's Money* (1893).

TRIFERRIN. A chalybeate which has been tested at Göttingen, in the clinic of Professor Ebstein, during 1898, 1899, 1900, and 1901 is triferrin, a paranucleic acid iron. It is soluble, readily assimilable without gastric disturbance, and is in the available powdered form. It contains iron, phosphorus, and nitrogen. In doses of .3 gramme, 3 times a day, in one of Ebstein's cases of chlorosis, the hemoglobin rose in two months from 15.2 per cent. to 70.75 per cent., and the number of erythrocytes increased from 2,600,000 to 4,800,000.

TRINIDAD and TOBAGO, the two southernmost West Indian islands, constitute a British crown colony. Trinidad has an area of 1,754 square miles and

a population (1900) of 272,000, of whom 78,000 are East Indians. Tobago, with an area of 114 square miles, has a population of 21,000. The seat of government is Port-of-Spain, Trinidad (population 33,273); it has the finest harbor in the West Indies. There are 204 schools in the colony, with an enrollment of 24,866 pupils, and two colleges, with 300 students. The revenue in 1900 was £681,339 and the expenditure £748,151. The public debt is £918,472, largely representing remunerative public works, especially the railway. In 1900 the imports were valued at £2,535,935 and the exports £2,572,891. The principal exports are cacao, sugar, molasses, and asphalt. In 1900 the asphalt exported from the remarkable asphalt lake near the village of La Brea, on the island of Trinidad, amounted to 140,000 tons. Cacao is the staple product, the area under cultivation being nearly twice that of sugar, and extending steadily. There are 81 miles of railway, all in Trinidad, and 690 miles of telegraph and telephone.

TRINITY COLLEGE, Hartford, Conn., founded in 1824, has productive funds amounting to \$750,000. The faculty consists of 27 professors and instructors, and the student-body numbers 131, of whom 8 are graduates. The library comprises over 42,000 volumes and 27,000 pamphlets, and is steadily growing. Many valuable bequests were made to the Hall of Natural History, among others being a large collection of minerals, the first installment of a valuable herbarium, and a large collection of Connecticut insects. During 1901 the college grounds were much improved.

TRIPLE ALLIANCE, or League of Peace, as it is sometimes called, has been from its inception the conservator of European peace; yet the year 1901 brought the question of its renewal within the realm of international speculation. The antagonism between Austria-Hungary and Russia in the Balkans, and the ambition of the former to secure a commercial route to Salonica, together with the threatened *révanche* of France against Germany, led to the alliance, in 1879, of Austria-Hungary and Germany, while Italy was in passive sympathy. The continued hostility of the Vatican, and the clashing of her colonial interests with those of France, induced Italy, however, to assume a fuller responsibility, which she did in 1882, thus completing the Triple Alliance. The provisions of the agreement are not fully known, but that they are mainly defensive is not open to doubt; for the early statement of the signatory powers to that effect has been amply proved by subsequent history. None of the powers is pledged to render aid, when the war is an offensive undertaking, or when the legitimate interests of the country making war are not concerned; the Italian fiasco in Abyssinia (1896) was regarded as in the latter class. The meeting, in 1887, at Friedrichsruhe, between Bismarck and Crispi, was generally regarded as of great political significance, a still closer offensive and defensive alliance being surmised, with a special proviso, according to French public opinion, that in the event of war between France and Germany, Italy would invade southwestern France with 200,000 men. On the other hand, the English press inclined to the belief that the part of Italy would be to relieve Austria-Hungary of the necessity of guarding her Italian frontier, and engage the French on the Alps. Of the allies, Italy, comparatively, because of her impoverished condition and limited resources, is more of a geographical circumstance than a factor of combatant value. Meanwhile, the Dual Alliance of France and Russia, which had its inception in the *rapprochement* of 1887, culminated in a series of naval visits between France and Russia, beginning with the visit of Admiral Gervais to Cronstadt in 1891 and ending in the formal acknowledgment of the Dual Alliance. In its potentiality the Dual Alliance is as problematical as that of the Triple Alliance; and while its result thus far has been to strike a balance of power, which in itself is a guarantee of peace, it has also afforded Russia a market for the floating of important loans, and "saved France from herself." Although of value to the latter power sentimentally, it did not prove of any more practical help during the Fashoda imbroglio (1898) than did the Triple Alliance to Italy in the Abyssinian incident already noted. The Triple Alliance was renewed in 1891, and again in 1896, when Roumania was admitted; and unless again renewed, it will expire in 1903. During 1901 the growing friendliness of Italy with France; the strongly expressed dissatisfaction of the former with the commercial treaties, soon to expire, between the allies; the healing influence of time in the attitude of France toward Germany; Austria-Hungary's dislike of Germany's Turkish policy; the recrudescence of the old pre-Bismarck rivalry; and the growing universal reluctance to war, have all been taken into account, and their bearing on the renewal of the Triple Alliance much discussed. The Russian and French press generally profess to see clear indications of approaching dissolution, while the Germans, deriving, as they do, the greatest benefits from the Alliance, are naturally optimistic. Austria-Hungary's political struggle against Russia for the maintenance of the Balkan states is a matter affecting her material existence; hence, whatever her troubles with Germany, they do not nearly balance the advantages such an alliance gives her. Italy, apparently, is the unknown quantity. The visit of the

Italian fleet to Toulon early in 1901, and the unsatisfactory treaties already mentioned, have led many to suspect her of an intention to leave the Triple Alliance and possibly join that of France and Russia. Little can be gleaned from the Italian press; but on June 14 the minister for foreign affairs, Signor Prinetti, speaking in the Chamber of Deputies of the nation's foreign policy, declared in effect that if Italy could obtain advantageous treaties she would renew the Alliance. He affirmed its pacific import, and implied by inference that Great Britain would resist any encroachment on Italian rights in the Mediterranean. Alliances usually are dictated from motives of national defense, anticipated aggression, or commercial necessity; and it is from these points of view that the horizon of the political future must be scanned.

TRIPOLI, a vilayet of the Ottoman Empire in North Africa, situated on the Mediterranean Sea between Tunis and Egypt, has an estimated area, together with Benghazi, of 398,900 square miles, and an estimated population of 1,300,000. Tripoli is the chief town, with 40,000 inhabitants. The revenue, which is raised chiefly by a poll-tax and tithes, amounted in 1899 to £110,000. The expenditure in the same year was £160,000. The imports in 1900 were valued at £499,500, and the exports at £418,500 largely esparto, skins, ostrich feathers, and sponges. The leading industries include agriculture and the weaving of cotton and straw.

In December, 1901, serious disturbances, occasioned by decrees imposing military service and increasing taxation, took place near the city of Tripoli, resulting in the proclamation of a state of siege throughout the oasis. Late in the same month the government of Tripoli notified all United States protected residents that unless they renounced the protection of their flag within 15 days they must quit the country. Mr. Eddy, the United States minister to Turkey, thereupon entered protest with the Porte. During 1901 there were frequent rumors and unofficial statements published to the effect that negotiations were in progress between Great Britain, Italy, Spain, and France whereby Italy would obtain possession of Tripoli, Great Britain Tangier, and France all the rest of Morocco; and little attention seemed to be given to a most important factor in the question, the sultan.

TROPICAL MEDICINE. A preliminary report of the investigations conducted by the members of the Yellow Fever Expedition of the Liverpool School of Tropical Medicine was published in February, 1901. The investigators were Dr. Herbert E. Dunham and Mr. Walter Myers. Both contracted the disease, and Mr. Myers's case proved fatal. His death delays the full report. They found in all fatal cases of yellow fever a small bacillus, resembling that of epidemic influenza (Pfeiffer's bacillus), which had been observed previously by Sternberg, surgeon-general of the United States army, and others. They did not claim that this was the undoubted cause of the disease. A search for protozoa, which might be specific, was prosecuted unsuccessfully. See CAVITE FEVER; COCHIN-CHINA DIARRHOEA; DYSENTERY; FILARIA; LEPROSY; MALTA FEVER; YELLOW FEVER; also CHARITY ORGANIZATION (paragraph Consumption).

TROUBETZKOY, PAUL, Russian sculptor, in 1901 took first place in the competition for the equestrian statue of the late Emperor, Alexander III., soon to be erected at St. Petersburg. He was born at Intra, Lago Maggiore, Italy, February 15, 1866. His father was Prince Pierre Troubetzkoy, and his mother an American. His natural taste for art led him to abandon his preparations for a military career, and he went to Milan, where for a short time he studied sculpture. He soon, however, determined to follow his own methods. In 1886 he exhibited the figure of a horse in Milan, which attracted notice, and his "Indian Scout," the modeling for which was made while Colonel Cody ("Buffalo Bill") was performing in Milan, won for him a gold medal when exhibited at Rome in 1894. He went to St. Petersburg in 1898, and subsequently became professor of sculpture at the Academy of Fine Arts in Moscow. Besides his idealistic work, which is marked by unusual naturalness of pose and delicacy of feeling, he has executed portrait busts of Tolstoy and others.

TRUST AND LOAN COMPANIES. The statistics of trust and loan companies for the fiscal year ending June 30, 1901, show that within four years the aggregate resources of these companies doubled, the total resources increasing from \$843,713,745 in 1897 to \$1,614,983,605 in 1901. In the same period the deposits increased from \$566,922,205 to \$1,271,081,174. The surplus fund, however, did not increase so rapidly, the surplus in 1897 being \$68,825,967, and in 1901, \$119,609,186. The capital stock has increased even less rapidly, being \$106,968,253 in 1896, and \$137,361,704 in 1901. During these years the total cash on hand held by the loan and trust companies diminished from \$28,587,626 to \$24,810,203, and the loans on real estate diminished from \$63,643,137 to \$59,579,122. On the other hand, loans on other collateral security increased nearly threefold, from \$236,044,125 to \$607,868,759. Geographically, the loan and trust companies are all situated in the New England and eastern States, with the exception of 40 in Kentucky, Indiana, and Minnesota. The total resources

of the trust companies in the New England States on or about June 30, 1901, were \$230,800,720, while the resources of those in the eastern States were \$1,364,333,638. The major part of this latter amount was localized, Pennsylvania trust companies having resources aggregating \$287,995,246 and New York trust companies resources aggregating \$966,528,399. From this it may be seen that the New York trust companies, of which all the large ones are situated in New York City, possess over one-half of all the resources of the trust companies in the country, and the same thing may be said of the deposits of the New York companies, which amounted in 1901 to \$802,518,096. From the fact that the trust companies of the country are situated, broadly speaking, at the centres of industry, and from the further fact that while the resources of all trust companies have doubled within four years, and while their loans on collateral security have nearly tripled, yet their loans on real estate have diminished, it may safely be inferred that the predominant characteristic of the banking business at present conducted by trust and loan companies consists of demand loans made with stocks and bonds as security. This form of loan allows the trust companies to hold individual deposits subject to interest and demand checks, and in making such loans the companies have the advantage of escaping the limitations imposed upon national banks by the provisions of the banking laws in the matter of reserve funds.

The following table, prepared from reports made to the comptroller of the currency, shows the number, deposits, and total resources of all trust and loan companies in the United States for the fiscal years 1900 and 1901. The reports from the companies upon which the figures are based were not all made at the same time; but the figures for each year were given about June 30.

STATES, ETC.	NUMBER OF COMPANIES.		DEPOSITS.		TOTAL RESOURCES.	
	1900.	1901.	1900.	1901.	1900.	1901.
Maine.....	17	17	\$ 9,068,640	\$ 11,091,434	\$ 12,152,207	\$ 14,653,598
Massachusetts.....	34	35	106,674,935	117,924,863	128,296,908	143,679,131
Rhode Island.....	6	9	40,592,389	46,999,463	46,511,314	57,920,414
Connecticut.....	14	16	8,540,191	10,979,519	11,483,840	14,547,583
Total New England States.....	71	77	\$163,866,155	\$186,995,279	\$198,444,269	\$230,800,700
New York.....	59	68	\$640,837,146	\$802,518,096	\$796,483,887	\$966,528,399
New Jersey.....	30	32	40,045,780	50,568,356	52,673,028	65,683,732
Pennsylvania.....	97	115	160,259,761	196,552,932	234,182,504	287,995,246
Delaware.....	2	3	3,323,140	3,724,878	4,750,077	5,441,121
Maryland.....	6	6	4,201,875	9,017,219	13,786,369	20,258,351
District of Columbia.....	4	4	10,714,037	12,791,867	16,047,722	18,426,789
Total Eastern States.....	198	217	\$859,387,639	\$1,075,173,338	\$1,117,922,577	\$1,364,333,638
Kentucky, (total Southern States)	3	4	\$322,081	\$396,072	\$2,388,078	\$3,125,624
Indiana.....	12	29	\$3,677,329	\$7,372,407	\$7,183,122	\$12,335,208
Minnesota.....	6	7	989,203	1,144,078	4,222,299	4,386,409
Total Middle States.....	18	36	\$4,666,532	\$8,516,486	\$11,405,419	\$16,721,617
Total United States.....	290	334	\$1,028,232,407	\$1,271,081,174	\$1,330,160,343	\$1,614,981,605

For other banks in the United States, see articles NATIONAL BANKS; STATE BANKS; SAVINGS BANKS, and PRIVATE BANKS. For the resources of all banks in the United States, see article BANKS-BANKING (paragraph Resources of Banks in the United States).

TRUSTS. The United States Industrial Commission has compiled a review and analysis of the evidence given before it by the representatives of a number of the principal industrial combinations in the United States. The Commission finds that the chief cause of the formation of industrial combinations has been excessive competition; that business men find their profits declining owing to the pressure of competition, and this brings them together to check competition. The Commission does not attach much importance to the claim that the protective tariff is the cause of trusts, the bulk of the testimony being opposed to this view. The principal savings effected by combinations are as follows: "(a) The regulation of production. Where there is no general understanding among producers there is a strong tendency to over-production, so that markets become demoralized and competition excessive. The combination is able so to fit the supply to the demand that while consumers can be fully supplied at current prices, there is no danger of over-production. It is thus a means of preventing panics and periods of depression. (b) The advantage that comes from the possibility of carrying much smaller stocks of goods. This saves not merely the investment of capital, but also interest on running capital, insurance, storage charges, shop work, etc. (c) This same control of production enables the

combination to keep its factories running full time, thus keeping labor fully employed. It has been found that the percentage saved in the cost of production by running a factory full time instead of half time was from 4 to 8 per cent. (d) When a large proportion of an industry is under the control of one central management, it becomes essential to success that the various products be standardized. In this way, the quality of goods can be made much more uniform than would otherwise be the case, and its excellence can be guaranteed. Furthermore, the number of styles of goods can regularly be very much reduced, thus lessening the cost of manufacture and effecting a saving in the amount of stock that needs to be carried. (e) The same influence leads to the larger use of special machinery, and to the adaptation of the workmen and the superintendents to the special departments for which they are best suited. In many cases, through this specialization, more can be saved than through the introduction, even, of new machines.

"Material savings are also made in the cost of selling, advertising, etc., as well as through a better knowledge and control of credit conditions. In addition, there is a noteworthy saving in many instances through shipping goods to customers from the nearest plants, and large combinations also make special gains by being able to ship exclusively during seasons when water transportation furnishes competitive routes." The Commission takes up the proper basis of capitalization, with special reference to the United States Steel Corporation. "Before one can justify a high capitalization by the mere fact that dividends can be paid on it, one would perhaps need to inquire, in some cases at least, the source of power to secure these high earnings. If it were a monopoly power, some would not consider the high capitalization justified." The Commission found a large element of "good will" in the capitalization of the United States Steel Corporation, amounting in all to \$38,918,111, and that there was left for the pay of the syndicate and as treasury stock to be issued in future, of preferred stock \$92,418,152, and of common stock \$86,432,981. In reference to the question of monopoly, the conclusion is that there are practically no absolute monopolies, the United States Steel Corporation, for example, controlling at the present time between 65 and 75 per cent. of the steel industry of the United States. In reference to the question of price control, the conclusion is as follows: ". . . Unless a combination has either some natural monopoly of the raw material, or is protected by a patent, or possibly has succeeded in developing some very popular style of trade-marks or brands, any attempt to put prices above competitive rates will result eventually in failure, although it may be temporarily successful. On the other hand, by securing control of trade-marks, or by creating a demand for certain brands through skillful advertising, very material advances can be made." The Commission further rejected the charge so far as it related to the iron and steel industry, "that the great combinations are able at times to follow their smaller competitors into local markets, to make prices very low there in order to ruin their rivals, then to recoup themselves by higher prices in the general market." It is also pointed out that while the export prices of articles produced by trusts are lower than the prices charged the domestic consumer, this practice is justified by many business men on the ground of stability of business and regularity of employment. The relations of the combinations to wages and trade unions are also considered. No connection is shown in the first instance, and in reference to the attitude assumed toward trade unions, the opinion of witnesses was divided. Some of these witnesses, such as Mr. Schwab, rejected, so far as possible, any connection with them; but he also admitted that most of the companies of the steel trust employed union men and treated with the officials of the unions. In general, it cannot be seen that the organization of the trust has been attended with any serious injury to organized labor. This question, however, would doubtless have been qualified had the Commission taken into account, in making up their report, the unsuccessful outcome of the steel strike of 1901. In regard to remedies, the Commission remarks as follows: "Probably more of the witnesses think that something could be gained in the way of greater publicity regarding the business of the combinations, but some of the witnesses speak directly against any special degree of publicity."

Professor J. W. Jenks, the Commission's trust expert, has prepared a report on industrial combinations in Europe, of which the following is a summary: There is a strong tendency toward the formation of industrial combinations everywhere in Europe. In Germany and Austria the movement has extended as far as in the United States. In England, until recently, outside of many local combinations to keep up prices, the large industrial combinations did not exist. Within the last three years, however, a very active movement toward consolidation has developed. In France, the combination movement is less pronounced than in any of the countries mentioned. The main reason is the backward condition of French industry, and there is the further obstacle that the French criminal code is very severe against monopolistic attempts to control the market. The main cause of combination is stated to be the losses of unrestricted competition. The form of European combina-

tions closely resembles that form of industrial organization formerly common in the United States, in which the different concerns interested vested the control of their output in the hands of a central board of trustees, maintaining, however, their corporate identity. In Europe it is very common for a selling bureau to be organized, sometimes as a separate corporation, which fixes the output of each member of the combination, and so determines the price at which goods may be sold. In England, however, the practice has been for one large corporation to buy up the principal establishments in some line of industry, and so to approach monopoly control. The European combinations frequently refer only to goods sold within the country, leaving the export trade perfectly free. By keeping up prices in the home market, it is possible to make heavy concessions to the foreign consumer, and so to obtain a considerable advantage in foreign trade. This practice of selling abroad at prices lower than those charged the home consumer, when carried on in the United States, is made the basis of severe censure upon the managers of the combinations; but in Europe it excites no particular comment. The effect of foreign combinations upon wages has on the whole been favorable, although in some cases the desire to protect themselves against the exactions of trade unions has been a reason for manufacturers to unite. In regard to prices, it is admitted by the managers of European combinations that they are often able to secure higher prices for their products than would be possible under competition. The conclusions of the report, other than those already given, are as follows: "(1) There is, relatively speaking, little objection to combinations in Europe, and in some countries the government and people seem to believe that they are needed to meet modern industrial conditions. They do believe that they should be carefully supervised by the government, and, if necessary, controlled. (2) There is little or no belief that the protective tariff is responsible for their existence. . . . (3) Railroad discriminations have been practically abolished in Europe, and in consequence they have had no effect toward creating combinations. (4) The great degree of publicity in the organization of corporations has largely prevented the evils arising from stock watering, and has evidently had much effect in keeping prices steady and reasonable, and in keeping wages steady and just. (5) There seems to be no inclination toward the passage of laws which shall attempt to kill the combinations. That is believed to be impossible and unwise. Laws should attempt only to control, and that, apparently, through publicity, though the government may be given restrictive power in exceptional cases."

The most pressing demand for trust regulation is in the direction of greater publicity in their accounts. The most conservative of the financial journals are actively urging the passage of stringent laws on this subject. The following extract from an editorial of the *Wall Street Journal* presents the basis of this agitation: "A small number of men see some opportunity for doing a large business with a probability of profit. They would ask the public to furnish the money for carrying on this business. They would take this money and acquire the property needed with greater or less reference to such personal interests as they might have in the purchase. They would then carry on the business, also with some reference to personal interests. If the business prospered and it seemed probable that dividends could be increased, they would buy stock before the increase and sell it afterward. If the business did not prosper they would sell their stock, leaving outsiders to sell theirs when they saw fit. As long as the business was successful, outsiders would receive such a portion of the profits as insiders thought it best to pay. If the business went to pieces, insiders would endeavor to reorganize it on terms which would enable them to buy cheap and subsequently sell dear. The whole basis of the enterprise would be that a few men should greatly increase their opportunities for profit by employing other people's money, without feeling obligation to give those people information of changes in the business except in the form of an annual report, issued some months after the close of the fiscal year." Representative Littlefield, of Maine, has introduced in Congress a bill endeavoring to restrict capitalization to actual value, and to secure the publication of reports which shall give complete and accurate accounts of the financial condition of the companies which issue them. The main provision of the bill is as follows: "Every corporation engaged in interstate commerce shall, on or before September 1 of each year, file a return with the secretary of the treasury stating . . . when and where organized, naming constituent companies, their history and value, the amount of capital stock, amount paid in, whether cash or property; if property, describing in detail the kind and character, with its cash market value at the time it was received in payment; total indebtedness, giving purpose for which it was incurred, amount of funded debt, and cash realized on the same, a statement of assets at their cash market value; current assets and liabilities; total income, expenses, interest, salaries, and wages of employees, these statements to be made under oaths on blanks issued by the Treasury Department, with the usual penalty applicable to false statements." See UNITED STATES STEEL CORPORATION.

TUBERCULOSIS. The ravages of "the white plague," as tuberculosis has been called, continue. Statistics show that in some localities, as in great cities, about one-fourth of all deaths is due to tuberculosis of the lungs. As far as figures can be compiled, apparently one-seventh of the entire mortality of the world is due to the same scourge (Hirsch), exceeding the total deaths from war, plague, famine, cholera, yellow fever, and smallpox. Tubercle in various forms is the cause of nearly 70,000 deaths annually in England. The annual death-rate from pulmonary tuberculosis in Germany is estimated by Leyden to be 170,000, while about 1,300,000 tuberculous patients survive. France is credited with a mortality of 150,000 deaths a year from the same cause. In the United States, about 102,000 persons a year die of tuberculosis, and the number of tuberculous people surviving is stated by Vaughan to be 1,050,000. In New York State, over 13,000 deaths occur annually from pulmonary consumption. In New York City the total reached is 8,000; in Paris, 11,000; in London, 11,000 annually. Intestinal, osseous, meningeal, and urogenital forms of tuberculosis would swell these totals decidedly, if included. Startling figures are quoted from the statements of Dr. A. N. Rubel, of St. Petersburg, to the effect "that 37,000 persons, or 25 per cent., die yearly of tuberculosis" in that city. The only new remedy for tuberculosis suggested during 1901 is urea. In the hands of certain clinicians urea, given internally in doses of one scruple three times a day, proves useful in cases of ulcers, lupus, and enlarged glands in tuberculous patients.

Sanitariums.—The increase in the number of cases of the disease in the Dominion of Canada has resulted in a call of the governor-general, Lord Minto, upon a large number of prominent citizens and eminent physicians, who met in Ottawa in February, 1901, to perfect an organization to make war upon "the white plague." A society was formed, termed the Canadian Association for the Prevention of Tuberculosis, whose earliest duty will be to provide for the erection of sanitariums for consumptives in the different provinces. The New York Academy of Medicine has taken the initiative, and has secured the cooperation of other medical bodies in that city, during 1901, in securing the erection of a municipal hospital outside of the city limits for incipient and presumably curable cases of pulmonary tuberculosis, with the idea that another institution for advanced cases shall be constructed within the corporate limits. It was estimated in 1901 that there were between 25,000 and 30,000 cases of the disease in various stages in Greater New York City. At Silver City, N. M., a modern institution for the treatment of tuberculosis, St. Joseph's Hospital, was equipped during 1901 under the charge of the Sisters of Mercy. The climatic advantages of Silver City are unusual. The altitude is 6,000 feet above the sea, the annual rainfall is less than 15 inches, and the atmosphere is dry, while the summers are cool and the winters warm. Dr. E. S. Bullock, formerly pathologist of the United States General Hospital for Tuberculosis at Fort Bayard, N. M., is medical director. In accordance with an act of the legislature of the province, Nova Scotia is to have a sanitarium for consumptives on the congregate plan, with accommodation for 20 patients, located either at Dutch Village near Halifax, or at Bedford Basin. A similar sanitarium was erected in 1901 on the island of Teneriffe, for the open-air treatment of tuberculous patients, at an elevation of 1,200 feet above the sea, in the midst of beautiful scenery. Dr. J. T. Rothrock, state forestry commissioner of Pennsylvania, proposes that that State establish camps on the forest reservations, where tents shall be erected for the free use of consumptives under State supervision and regulation. The American Congress of Tuberculosis was held in New York City, May 15-16, 1901, delegates from nearly all the States, from Canada, and from South and Central Americas being present. The principal topic discussed was the possible arrest or control of the disease by legislation. It was generally agreed that legislative measures should include compulsory notification, compulsory disinfection of dwellings after the death of a consumptive, regulation of cubic air space in dwellings, and exclusion of milch cows with tuberculosis. A society for the study of tuberculosis, called the Laennec, was organized in connection with Johns Hopkins Hospital, Baltimore, in January, 1901.

Human and Bovine Tuberculosis.—In July, 1901, Professor Robert Koch, the discoverer of the bacillus of tuberculosis, announced that he had discovered that there was a difference between the bovine and the human tubercle bacillus. This discovery, however, was made by Dr. Theobald Smith, professor of comparative pathology at Harvard University, who published in 1898 an exhaustive paper on the subject, in which he stated the difference in nature and growth between the human and the bovine bacilli. Professor Koch at the same time also advanced as original the idea that cattle do not spread tuberculosis. Whereupon Professor J. G. Adami, of Montreal, refers to a paper he read on August 30, 1899, in which he threw doubt upon the frequency of infection with tuberculosis through milk. This paper was published in two journals. But Adami considers that the only safe precaution is to limit the possibility of infection from this source, while Koch's statement is positive. American observers who conducted similar experiments to those of Koch, inde-

pendently and some years previously, deplore the fact that Koch's position will cause so literal an acceptance of his statement by many that the fight against tuberculosis may be delayed. Professor Bronardel, dean of the Medical Faculty of Paris, claims that tuberculous cattle spread tuberculosis through their milk, thus contradicting Koch, and further advocates international legislation requiring notification of the disease.

National Quarantine Against Tuberculosis.—In the summer of 1901 the supervisor of immigration issued an order to debar immigrants suffering from tuberculosis from entering the United States. A storm of protest was raised by many lay and medical journals against the order as inhuman, and also on the ground that the disease is curable, is chronic in type, is preventable, and is not contagious, but only communicable. Retaliation, whereby tuberculous Americans would be prevented from seeking beneficial foreign climates, was also considered as probable. But calmly considered, in view of the spread of tuberculosis in all our cities to which immigrants go, and the increased difficulty of accurate notification of imported cases, the order seems wise and proper, and as justifiable as the similar regulation against immigrants suffering with yellow fever. See HOSPITALS; INSECTS AND THE PROPAGATION OF DISEASES; LECITHIN.

TULANE UNIVERSITY OF LOUISIANA, New Orleans, founded 1834. During the year 1900-01 the faculty consisted of 80 professors and instructors, and the student-body numbered 1,144, excluding duplicate names, as follows: Graduates, 34; college of arts and sciences, 85; college of technology, 104; H. Sophie Newcomb Memorial College (for women), 127; art students, 89; in physical education, 8; Newcomb High School, 98; medical department, 413; law, 77; department for teachers, 115. The productive endowment fund of the university amounted to about \$1,350,000. Its buildings and equipment represent an investment of about \$850,000. During the year a bequest of more than \$1,000,000 came from Mrs. Josephine Louise Newcomb (*q.v.*), a benefactress of the college in years past. In 1900 Mrs. Caroline Tilton donated \$50,000 for the erection of a library building, which has since been completed. The library contains about 35,000 volumes.

TUNGSTEN. Ores of tungsten have always been looked on as rather rare in the United States, but recently several occurrences have been reported from different parts of the country. Tungsten ores are now known to occur in a number of localities in San Juan, Boulder, Gilpin, Ouray, and Lake counties, in Colorado, and according to the commissioner of mines of that State, 91,000 pounds were shipped from San Juan and Boulder in 1900. The ore ranged from 63 to 71 per cent. tungstic acid, and was shipped to eastern cities, where its value is said to be from \$2 to \$3.50 per unit of tungstic acid. During 1900 a considerable quantity of tungsten ore was also mined near Long Hill, Fairfield County, Conn., but very little of it was marketed. Another deposit of tungsten ore, occurring south of Osceola, White Pine County, Nev., was developed during the same year and may become an important producer. The minerals serving as ores of tungsten are wolframite (a tungstate of iron and manganese), hübnerite (manganese tungstate), and scheelite (a tungstate of lime). Tungsten is used in the manufacture of the alloy known as ferro-tungsten, while another alloy of tungsten with aluminum and copper, is chiefly used for making propeller blades. Tungsten also serves as a coloring agent in the manufacture of glass.

TUNIS, an African protectorate of France on the Mediterranean Sea, has an estimated area of about 51,000 square miles and an estimated population of 1,902,000, largely Bedouin Arabs and Kabyles. The French population is estimated (1901) at 28,811, of whom 10,000 belong to the army of occupation. Most of the inhabitants are Mohammedans. Tunis, the capital, has a population of 153,000, of whom 40,000 are Europeans. The administration, nominally in the hands of the Bey Sidi Ali, is in reality under the control of a French resident-general. According to the budget of 1901, the total revenue was estimated at 39,237,154 francs, and the expenditure 39,122,435 francs. The franc is worth 19.3 cents. The chief industry is agriculture, the principal products being barley, olives, dates, almonds, and fruits. Iron, lead, and zinc are mined, and the products of the quarries are valuable. The imports in 1900 amounted to 61,142,241 francs, as against 55,778,241 francs in 1899, and the exports 42,560,191 francs, as against 49,433,460 francs in 1899. Of the imports, 59 per cent. came from France, and 51 per cent. of the exports went to that country. The total length of railways in 1898 was 883 miles, of which 866 belonged to the state. There are now 150 miles under construction. Negotiations looking toward the abrogation of the treaties between Tunis and the United States, entered into a hundred years ago, when Tunis was an independent country, were pending at the close of 1901. It was proposed to extend the provisions of existing French treaties to the country.

TUNNELS. During 1901 several notable tunnel works were in progress, and others were projected with a fair chance of being carried to completion. Among the

works in progress, the most important was the Simplon tunnel, on the Jura-Simplon railway, in Switzerland. Of the 64,718 feet of tunnel, 33,226 feet had been completed in September, 1901. Considerable trouble was experienced during the latter part of the year with the large quantities of water encountered in the south heading. Another Swiss tunnel work of note was the Albula tunnel, on the railway line from Thuris to St. Moritz, being built by the canton of Graubünden. This is a single-track tunnel located on a straight line, and is 19,240 feet long, with a clear height of 16.4 feet, and a maximum width of 13.12 feet. The material penetrated is mostly a compact granite; but occasional stretches of softer materials have been encountered, which have given much trouble from water. The estimated cost of the tunnel is \$1,150,000. In America, the Aspen tunnel, on the Union Pacific Railway, which was completed in October, 1901, was the largest tunnel completed during the year. This tunnel is 5,900 feet long, and pierces the Aspen Range, one of the eastern foothills of the Wasatch Mountains. Its construction has been attended with great difficulties, owing to the large volume of water encountered at different points, to the gas, and to the unstable shale rock penetrated. In some places the material swelled like a sponge when wet, crushing all timbering and necessitating the use of iron and steel to reinforce the heaviest timbers obtainable. Another Union Pacific tunnel completed during the year was the Sherman Hill tunnel, 1,800 feet long. Still another Rocky Mountain tunnel of some importance was the Summit tunnel, on the Utah Central Railway, about 19 miles from Salt Lake City. This tunnel is 1,116 feet long. One of the most serious pieces of tunnel work in progress during 1901 was the so-called loop tunnel on the Canadian Pacific Railway, in British Columbia. This tunnel is only 900 feet long, but it slants on a 10° curve, which compounds at about the centre of the tunnel with an 11° curve. So exact was the workmanship on this tunnel that the headings started at the two ends met perfectly at the centre. A rock tunnel of considerable importance was begun during 1901, in connection with the hydro-electric power development in progress on the Canadian side of Niagara Falls. This tunnel will form the tail race which takes the water from the turbines, and will be 2,000 feet long, 21 feet high, and 18 feet wide, with a horseshoe-shaped cross section. The only submarine tunnel of much importance actively under construction during 1901 was the East Boston tunnel extension of the Boston subway under Boston Harbor. The total length of this tunnel is about $1\frac{1}{4}$ miles, of which 2,250 feet are under the harbor. This harbor portion will have inside dimensions of 23 feet by 20 $\frac{1}{2}$ feet. The lining will be of concrete.

Of the various projected tunnels which have any likelihood of construction in the near future, the most important is the proposed tunnel entrance of the Pennsylvania Railroad into New York City, the plans for which were announced in December, 1901. This tunnel, which will eclipse any in existence, will be constructed by the Pennsylvania and Long Island railways through the heart of New York City, and under the East and Hudson rivers, which form the eastern and western boundaries of Manhattan Island. It is stated that the tunnel, when complete, will be the longest in the world, and a wonderful triumph of engineering skill over unusual obstacles. The length of the tunnel will be over 15 miles, while the one now being driven through the Simplon is $12\frac{1}{2}$ miles long. The most serious difficulty of the undertaking lies in the character of the bed of the North River. Experiments showed that while the bed of the East River is practically hard rock, and comparatively easy to pierce, that of the North River is so soft as to be unable to support such a weight as the tunnel would have to carry. The whole subway will be burrowed through the soft mud of the river bed, and supported at short intervals by piles driven deep enough for their ends to rest on the rock beneath. Inside the tunnel there will be bridge-work from end to end, which will rest on the piers, so that in reality the work will consist of a bridge and tunnel combined. The project is estimated to cost \$50,000,000. The main New York terminal will be located in the vicinity of Broadway and Thirty-fourth Street, and will, it has been stated, consist of 25 underground terminal tracks.

A tunnel project which eclipses even this American enterprise, however, is the proposed Irish Channel tunnel, for which the promoters asked the financial aid of the British government during 1901. A description of this scheme, based upon official information, was published in *Engineering News*, May 23, 1901, and from it the following account is abstracted: The total length of the proposed tunnel is about 35 miles, of which some 25 miles are under the sea. The latter part of the works are at a depth of 150 feet or more below the bottom of the ocean, and under water with a depth of 400 to 500 feet. The cost is estimated at £10,000,000 or £12,000,000, including the interest during construction, which it is estimated will require 12 to 14 years. Besides Mr. James Barton's backing, the scheme was examined and approved some years ago by several eminent civil engineers. It is admitted by the advocates of the scheme that the question whether the traffic which the tunnel would secure would be sufficient to pay interest on its construction is a

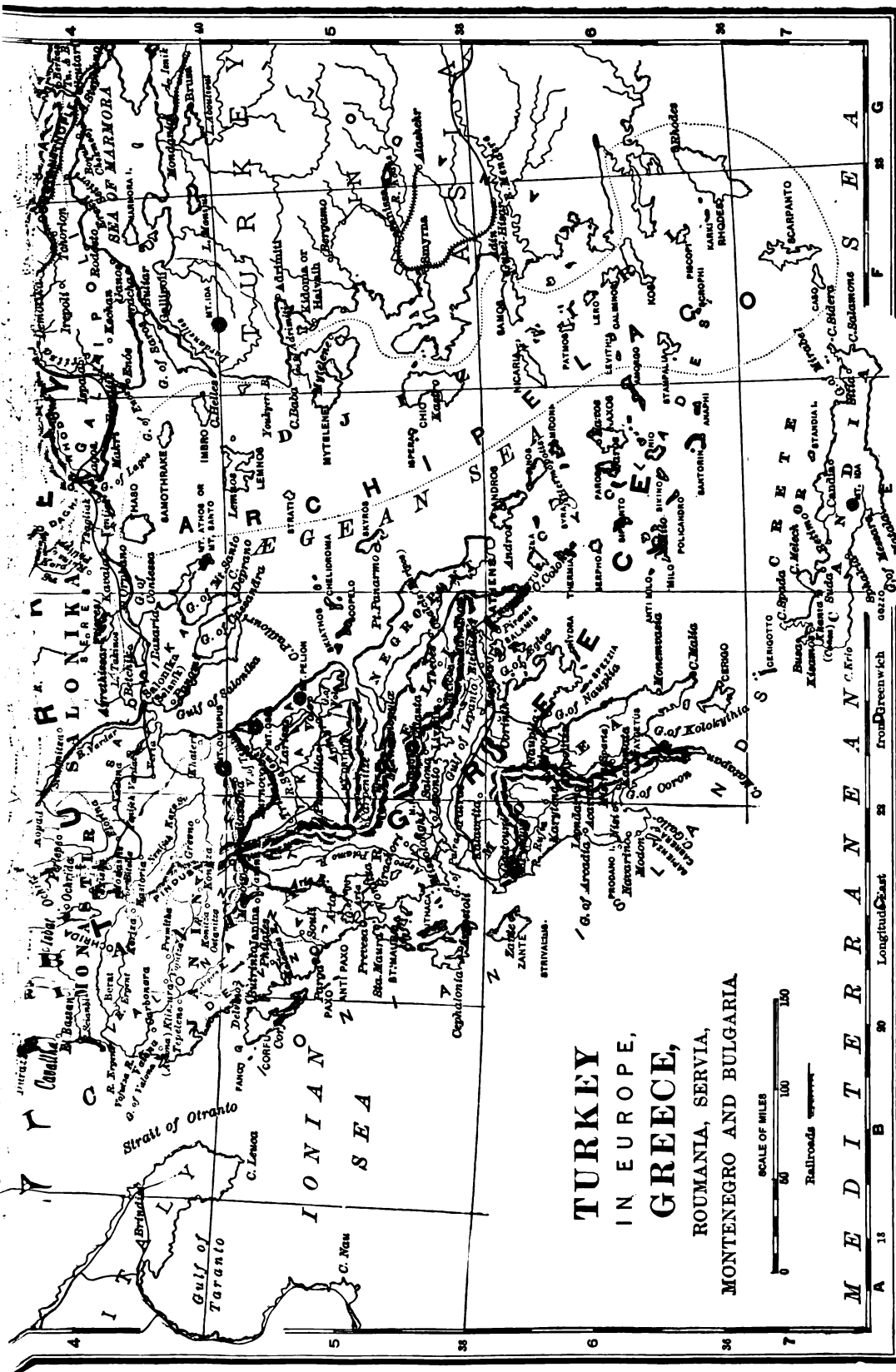
doubtful one. The provisional committee of the Irish Channel tunnel has offered to construct the tunnel, provided the British government will guarantee that upon its successful completion and opening to traffic its revenues shall pay a dividend of 3 per cent. on the share capital of £12,000,000. The government would be required to make no payment until the completion of the tunnel, some 12 or 14 years hence, and only then to the extent of making good any deficiency in the net revenues to pay the above-named dividend. The route adopted by the provisional committee is that selected by Mr. Barton some years ago. It passes well to the northward of the deep depression in the channel known as Beaufort's Dyke, where the water averages 700 to 900 feet in depth, and is thus somewhat longer than a direct route would be. On the other hand, the great depth necessary to pass under this deep chasm is avoided.

TURKEY, or the OTTOMAN EMPIRE, an absolute monarchy in south-eastern Europe, western Asia, and northern Africa. Turkey proper has an estimated area of 1,115,046 square miles, and an estimated population of 24,931,000. Including the tributary states, the population is nearly 40,000,000. The capital is Constantinople, with an estimated population of 1,125,000. The supreme head of the government is the Sultan, Abdul Hamid II. since 1876, under whom executive and legislative powers are exercised by the grand vizier as head of the temporal, and the Sheik-ul-Islam as head of the religious, government. These functionaries, with ten other ministers, constitute a ministry of state. The active army is over 700,000 strong, and on a war footing was estimated in 1900 at 1,500,000. The navy, consisting of obsolete wooden vessels, and ineffective, as judged by modern standards, comprises a half-dozen cruisers of the second and third class, 18 ironclads, mostly coast-defense vessels, and a number of torpedo boats and monitors. The revenue for the fiscal year 1897-98 (the latest for which figures are available), was £118,511,322 and the expenditure £118,429,411 (£T equals \$4.40). The debt on July 1, 1900, was £136,407,659, the chief item being the balance of the Russian war indemnity, amounting to £24,513,000. The administration of the debt and the service of the greater part of the loans is in the hands of an international council of administration at Constantinople. The amounts collected by the council in 1900 aggregated £2,616,785. The latest commercial statistics are for the year 1898, when the imports amounted to £23,434,036 (an increase of £2,074,329 over the preceding year), and the exports to £15,428,458 (a decrease of £1633,959 from the preceding year). The chief countries trading with Turkey were, in the order of their importance, Great Britain, France, Austria-Hungary, and Russia. Two-thirds of the total trade was with France and Great Britain. The trade of Turkey with the United States in 1901 was \$8,879,639, of which \$8,194,535 represented imports from Turkey to this country, and only \$685,104 exports from the United States to Turkey. At the beginning of 1900 the total railway mileage was 2,953, of which 1,240 were in European and 1,713 in Asiatic Turkey. A number of other lines are under construction, most of them in Asia. The roads are owned and operated by English, French, and German companies on concessions granted for a term of years. The longest and most important single road is the Anatolian railway, a line under German control running from Constantinople to Konieh, a distance of 634 miles.

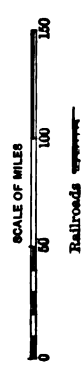
The Bagdad Railway.—During 1901 Germany made active efforts to secure from Turkey a guarantee that would enable the Anatolian Railway Company, a German corporation to which concessions were granted in 1899, to begin the construction of its line from Konieh, the terminus of the present German railroad, to Bagdad, and thence to El Koweyt, on the Persian Gulf. The final surveys were completed early in the year, and the company was anxious to begin building operations at once. By the terms of the preliminary convention of 1899 the company undertook to construct, within eight years, a railway line from Konieh, via Bagdad, to a point on the Persian Gulf, Turkey reserving the right to purchase the line at any time, and the construction to begin under "conditions and guarantees to be determined by common agreement." This "common agreement" hindered the building of the road. The company asked for a guarantee amounting to \$6,000,000 a year, an amount which the Porte was unable to raise without the consent of the committee of the powers to an increase in Turkey's customs tariff from an average of 8 to 11 per cent. To this increase the representatives of Russia and England will not agree. In order to obviate this difficulty, the Anatolian Railway Company made an attempt to interest Russian and English capital in the enterprise, with the idea that the powers would not attempt to block any scheme in which their own citizens were interested. This attempt was considered of such importance that M. de Witte, the Russian minister of finance, publicly requested Russian capitalists not to accept the proposition, holding, among other things, that the road would become a competitor of the Siberian and Turkistan railways, and, by involving Turkey still further in debt, would hamper and delay the payments on the Russian war indemnity. Negotiations were still pending at the close of the year, the later German demands being for a guar-



100



TURKEY
IN EUROPE,
GREECE,
ROUMANIA, SERVIA,
MONTENEGRO AND BULGARIA



antee of 13,000 francs net traffic receipts per kilometre and 4,500 francs per kilometre for working expenses. The line, if constructed, will have a total length of 2,500 kilometres (1,553 miles). Beginning at Konieh, the main road will run through Carmania, via Adana, Mosul, and Bagdad, to the Persian Gulf. There will be five branches, namely, to the Gulf of Iskandrum, Aleppo, Orfah, Hanekin, and Kazinca.

HISTORY.

The Albanian and Macedonian Disturbances.—The unrest in the Adriatic province of Albania, long one of the worst governed parts of the Turkish dominions, assumed the proportions of an actual revolt early in 1901. Turkish control in the province, which stretches for 300 miles along the eastern shore of the Adriatic Sea, has been mostly confined to the towns and their immediate neighborhoods, the mountain districts having remained practically independent. The male portion of the population has nominally adopted the Mohammedan religion to escape persecution, but the majority of the population still remain at heart adherents of the Roman or Greek Catholic churches. The question of nationality, too, plays an important part in the affair. With Italy, particularly, Albania is closely connected by racial ties, there being over 100,000 Italians in Albania, and 500,000 Albanians in Italy. The Italians have for half a century looked forward to the day when the Adriatic would be an Italian sea, and their sympathies have always been active with any anti-Turkish movement in Albania that would seem to hasten that outcome. Austria, too, has had her eye on Albania for years, hoping to increase her coast line on the Adriatic south from Dalmatia. A third element to be taken into account is Russia, whose interest in Albania probably extends no farther at present than a desire to see it incorporated with Serbia or another of the pro-Russian Balkan states, in order to increase her own prestige and influence in southeastern Europe. Altogether, the Albanian question is looked upon by many as one of the most serious disturbing influences in the Triple Alliance (*q.v.*) The revolt in the spring and summer of 1901 was no doubt inspired by similar uprisings in Macedonia. Judging from its effects on the several nations interested, it must have been considered of much greater importance and significance than the constantly recurring revolts in the other Turkish provinces. Austria immediately strengthened the garrisons on her southern frontier. Russia entered a vigorous protest with the Porte, and Italy showed her sympathy unmistakably, as evidenced in a speech of Signor Prinetti, the minister of foreign affairs, and in a demand made at an Albanian congress in Naples in June, of which ex-Premier Crispi was honorary president, that Italy put an end to the oppression of the Albanians by Turkey. The Turkish government for some time made no effort to pacify the insurgents, allowing the local authorities to adopt such measures as they saw fit. As usual in Turkey, these measures amounted to outrages which still further aroused the Albanian peasantry. The entire northern and central part of the province rose in revolt, and bands of brigands chased hundreds of Turkish residents over the Servian border. Turkish troops crossed in pursuit and laid waste several Servian towns. The situation was very similar to that existing to the eastward along the Bulgarian-Macedonian border. In that region the Macedonian Central Committee (see BULGARIA, paragraph on Macedonia Committee) had excited the Bulgarians in Macedonia to revolt, and Bulgaria itself, although really in sympathy with the movement, was compelled to take action against the instigators of the revolt. The Servian government, having a natural feeling of hostility to Turkey, was inclined to show sympathy with the Albanian rebels. But their excesses and disregard for boundary lines rendered any actual aid impossible. The Servian minister therefore protested to the Porte, and his demands were backed up vigorously by Russia. The sultan sent a new governor-general into Albania, with instructions to deal with the insurgents firmly, but to put a stop to all outrages, with the result that by the end of the year the revolt, although not suppressed, had quieted down considerably.

The Kidnapping of Miss Stone.—On September 6 Miss Ellen M. Stone, an American missionary, together with Mme. Tsilka, the wife of an Albanian assistant, was kidnapped near the Macedonian village of Bousko by a band of Bulgarian brigands. It was declared at Constantinople that the brigands were acting under the suggestion or direction of the Macedonian committee at Sofia, with the hope of adding to the funds of the committee to forward their revolutionary propaganda. The Turkish government sent a squadron of cavalry after the brigands, who crossed the border into Bulgaria. At the request of the American diplomatic representatives the troops were withdrawn for fear that the captives would suffer if an armed attempt were made to secure their release. A ransom amounting to something over \$100,000 was demanded, and attempts to raise the amount were immediately begun in the United States, and at the end of the year the greater part of the sum had been subscribed. Advices from Bulgaria stated that Miss Stone and her companion were being well treated, and were not submitted to needless hardship.

Other Occurrences.—The persecution of the suspected members of the Young Turkey party continued throughout the year. Considerable excitement was caused early in 1901 by a book which appeared in Asiatic Turkey urging the Arabs to revolt and throw off the Turkish yoke. It was reported that the publication was fostered by Essid Hamid Eddin, a Hussanite and Koreshite, of the family of the Prophet, who had proclaimed himself khalif, and it was believed in some quarters that the disturbances in Koweyt and the outbreak in Yemen were for the furtherance of schemes. See ARABIA.

On May 5, 1901, the directors of the foreign post-offices in Turkey received from the government authorities a circular informing them that all mails destined for foreign post-offices would thereafter be opened and distributed by the Turkish postal officials, and on the same day notes were sent to the foreign embassies pointing out that the existence of the foreign post-offices did not rest on treaty provisions, and that it was the intention of the Porte to abolish them. The ambassadors protested, and late in the month the orders for their abolition were revoked.

The claims, amounting to \$95,000, made by the United States government on behalf of missionaries in Asia Minor whose property had been damaged in the Armenian outbreaks of 1895-96, were paid by the Turkish government to Mr. Leishman, the American minister at Constantinople, in July, 1901. For several years the United States has pressed these claims through its several ministers, Angell, Straus, Griscom, and Leishman, and it was not until after repeated promises by the sultan and the threat of a naval demonstration in Turkish waters that the claim was finally paid.

The appointment of Said Pasha as grand vizier on November 18 was regarded favorably by all the powers except Russia, as he is considered the very man needed to reorganize the central administration and bring order out of the existing chaos.

See ARABIA; ARMENIA; BULGARIA; CRETE; EGYPT; GREECE; FRANCE (paragraph The Sultan and the Quays); and TRIPOLI.

TURKISTAN, RUSSIAN, an extensive territory in central Asia lying between the Chinese Empire and Russian Transcaspia, and directly north of Afghanistan. Roughly, it comprises the three Russian provinces of Samarcand, Ferganah, and Syr-Daria, with a combined area of 257,134 square miles and a population of about 4,000,000, and the dependent khanates of Bokhara (area 92,000 square miles, population 2,500,000) and Khiva (area 22,320 square miles, population 800,000). The seat of government and chief town of the Russian provinces is Tashkent, with a population of 156,414. The capital of Bokhara is Bokhara, population 75,000; and of Khiva, Khiva, population 5,000. The Turkistan provinces are in charge of a Russian governor-general, the administration being largely military. Bokhara and Khiva are ruled by native ameurs, whose control in local affairs is complete, the foreign relations only being in the hands of Russia. The country produces wheat, maize, hemp, silk, tobacco, fruit, and cotton. There has been of late a noticeable increase in the production of cotton. The seeds are imported from the United States, and the cotton is prepared by the American system, except that, like the Egyptian cotton, it is packed in small bales, which are preferred in the Russian market. During the fiscal year 1900-01 the export of cotton into Russia, via the Caspian, amounted to 175,000,000 pounds from Turkistan, 27,000,000 pounds from Bokhara, and 12,080,000 pounds from Khiva. The estimated cotton crop in 1900 in Ferganah alone was 144,448,000 pounds; but through lack of shipping facilities only a portion of the product could be exported. The export from Samarcand was estimated at 32,500,000 pounds. In Samarcand the silk-worm industry is increasing, and in Syr-Daria successful experiments in sugar-beet cultivation have been made. Salt mining is growing in importance, but gold, alum, and sulphur are also found. The great difficulty with Turkistan has been the lack of transportation facilities. The cities of Bokhara and Tashkent are already connected by the trans-Caspian railway, and during 1901 work was begun on the Orenburg-Tashkent railroad, which will open up an extensive cotton-raising area.

TURQUOISE. See GEMS.

TUSKEGEE NORMAL AND INDUSTRIAL INSTITUTE, Tuskegee, Ala., was established in 1880 by Booker T. Washington, in the interests of the negro race, and was opened in 1881 with 30 pupils in attendance and 1 teacher. During the year 1900-01 the total enrollment was 1,231, of whom 872 were men and 259 women, and the faculty numbered 103; which included the officers, clerks, and the instructors in all departments. The students received instruction in 28 industries, and new courses are being introduced. Notwithstanding the stress put upon industrial training, great importance is laid upon normal training for those who expect to teach in the public schools. The library contains about 12,000 volumes, and will soon possess a separate building, due to a gift of \$20,000 from Mr. Andrew Carnegie. This building will be constructed entirely by students, and all the materials

will be furnished by students. In 1901 several buildings were in course of erection. The object of the institute is to furnish young men and women thorough training in literary, agricultural, and industrial branches, and, through its Bible-training school, to fit others for the ministry or some form of Christian work in the South. In 1901 an excellent account of the institute appeared in Mr. Washington's notable autobiography, *Up from Slavery*.

TYLOR, JOSEPH JOHN, Egyptologist, died at Cap d'Ail, Monaco, April 5, 1901. He was born at Carshalton, Eng., in 1850. Though educated as an engineer, he was best known as a specialist in Egyptian archæology, his series of the *Wall Drawings and Monuments of El Kab* (1895-1900) presenting almost exact reproductions of important ancient records.

TYPHOID FEVER. The chief reports regarding typhoid fever in 1901 came from South Africa. Up to July 1, 19,000 cases, with 5,000 deaths from the disease, were reported in the British army. Protective inoculation has been very successful. The method of Wright and Netley, of England, is generally employed. These physicians use a culture of the *bacillus typhosus*, which is rendered sterile by heating to a temperature of 60° C. A small amount of lysol is then added and the clear fluid is decanted for hypodermic use. A dose of 2 cubic centimetres is given an adult, and a second dose of double the amount is given later. Following the injection the patient experiences headache, pains and rigors, and occasionally faints. Fever supervenes and inflammation appears at the site of injection. Wright's statistics are as follows: Out of 11,295 persons, 2,800 were inoculated with the protective fluid. Of the inoculated, 0.95 per cent. developed typhoid, with a death-rate of 0.92 per cent. Of the uninoculated, 2.05 per cent. developed typhoid, and of these 3.4 per cent. died. The 15th Hussars numbered 718 men; of these, 539 were inoculated. Of the inoculated, the disease developed in 0.55 per cent., with a death-rate of 0.27 per cent. Of the uninoculated the incidence of the disease was represented by 6.14 per cent., and the mortality by 3.35 per cent. Henry Cayley's reports on the results of inoculation of the members of the staff and establishment of the Scottish National Red Cross Hospital serving in South Africa are very encouraging. Of the first section of this hospital, 61 persons in number, none had typhoid, all but 2 nurses having been inoculated, these having had the disease. Of the second section, 82 persons in all, one nurse had typhoid, and she had not been inoculated; 5 orderlies had typhoid, of whom 2 died. Of the 5 orderlies, 2 had been inoculated once, and 3 had not been inoculated; while of the 2 that died, 1 had been inoculated but once and the other had not been inoculated. The third section of the hospital consisted of 20 people. These were all inoculated and none had enteric fever. See INSECTS AND THE PROPAGATION OF DISEASES; VITAL STATISTICS.

UGANDA, a British protectorate in east central Africa north of Victoria Nyanza, comprises the kingdom of Uganda and the territories of Usoga and Unyoro. The entire protectorate has an area estimated at 120,000 square miles and a population of about 4,000,000. The capital of Uganda is Kampola, where resides the British resident commissioner, Sir Harry Hamilton Johnston (*q.v.*) since 1899. The local revenue for 1900-01 amounted to £66,000. The trade, which has increased rapidly within the last few years, consists chiefly of ivory, coffee, cattle, and rubber. With the extension into Uganda of the railway now completed from the coast to Victoria Nyanza, it is expected that the trade will be doubled. The value of the Uganda territory to Great Britain is great, not only because it is a connecting link between the East Africa Protectorate and what is practically British territory, the Egyptian Sudan, but because, as Sir Harry Johnston has pointed out, "the power that holds Uganda might by means of relatively simple engineering works, withhold the main source of the Nile water supply from the irrigation of Egypt." In October, 1901, Mwanga, ex-king of Uganda, and Kabanga, ex-king of Unyoro, were interned in the Seychelles. For an account of the okapi, discovered by Sir Harry Johnston, see MAMMALOGY; and for the Uganda Railway, see BRITISH EAST AFRICA.

UHL, EDWIN F., former United States ambassador to Germany, died at Grand Rapids, Mich., May 17, 1901. He was born at Avon Springs, N. Y., in 1841, and was educated at the University of Michigan, graduating in 1861. President Cleveland appointed him first assistant secretary of state in 1893, and ambassador to Germany in 1896. He held the latter position until 1897. While in the State Department he acted as arbiter of the boundary dispute between Brazil and Argentina.

UMBER. See MINERAL PAINTS.

UNION LABEL. The union labels represent a growing recognition of the need of cooperation among wage-earners, and an appreciation of the fact that they themselves are large consumers of certain classes of goods. "Don't expound trade unionism with a scab cigar in your mouth," is typical of the new feeling of responsibility. The cigar makers advertise their label extensively. They spend by constitutional provision one dollar a man a year for this purpose. Although the use

of labels dates back more than twenty-five years, the cigar makers being the first to use one, in 1872, as a means of distinguishing their cigars from those made by the Chinese, it has only recently become an economic force. Since 1897 economic writers have had their attention called to this peculiar development of trade unionism in the United States. The fact that the Consumers' League has adopted a label shows the value of this method of distinguishing goods. Certain labels—notably that of the hatters—are used principally as weapons against manufacturers. To the consumer the labels are “the outward and visible sign of an agreement between the manufacturer and the workmen, whereby a guarantee is given that the article having the label is manufactured under conditions of labor as fair as the existing market conditions of the trade will possibly allow”—in other words, that the requirements of the factory laws in regard to sanitation, hours of child labor, and safety appliances are met; and also those of the union for hours, wages, overtime, and apprentices. A label may thus mean protection to the consumer by making it possible to discriminate against goods manufactured under unsanitary conditions. The cigar makers claim this for their label. A new departure in trade-union advertising is found in a recent magazine advertisement, which reads: “Discriminate against inferior, unclean, and sweatshop clothing. Insist upon this label. Indorsed by all trade unions and leading reform societies.” On the opposite page of the magazine is given a list of manufacturers of union-labeled clothing. The International Ladies' Garment Workers' Union recently issued an appeal to the public to buy garments bearing their label, because “they are made under sanitary conditions beneficial to the public, and under union conditions beneficial to the workers.”

The central-labor leagues, or specially organized union-label leagues, of large cities, advertise the labels and publish bulletins and directories. The steps in the evolution of the union label have been to offer a means of discrimination: (1) Between white and Chinese labor; (2) between union and non-union made goods; (3) between factory-made and sweatshop-made goods; and, finally—a step as yet hardly realized—between good and bad workmanship. The label has met with much opposition, because of the prejudice against trade unions and boycotts. Its promoters claim that it is a more fair and powerful weapon than the boycott; that it brings about friendly conferences between employers and employees; and that it is a constructive force, harmonizing the efforts of labor unions, helping to improve labor conditions, and giving valuable information to the consumer.

Many new labels are adopted yearly. In March, 1900, the American Federation of Labor indorsed 33. There are advocates of a universal label, but the tendency is rather to reduce the number of labels within a trade. Nearly all the States have adopted statutes, frequently under a general trade-mark law, allowing members of trade unions to adopt labels to be used solely to designate the products of their own labor, or of the labor of members of their own trade unions. Provision is usually made for the registration of the label with the secretary of State; a penalty is provided for counterfeiting it; and remedies by injunction or equity process are granted against its infringement. By these laws the laborers' equity right in the product of his industry is recognized. Alabama, Florida, Oregon, and West Virginia passed laws during 1901, while Illinois, Wisconsin, and Pennsylvania amended their laws and statutes. Nevada and Montana require that all State printing shall bear the union label. More than 40 cities have made the same requirement for their publications.

UNITARIANS, a sect distinguished by belief in the unity of the Godhead, originated as a denomination in the United States in 1815. For 1901 the church reports 458 churches, with ecclesiastical property valued at \$10,894,000, 560 ministers, and 35,200 families, with an approximate membership of 71,000. During the past year 11 new churches have been established, and the missionary work of the denomination strengthened. In accordance with their policy of encouraging broadness of view, Unitarians give largely to the support of non-sectarian and public institutions in educational and charitable matters; they maintain, however, a theological school at Meadville, Pa., and three secondary institutions of learning. The denominational activities are carried on chiefly by the American Unitarian Association (see below), Women's National Alliance, Young People's Religious Union, and the Sunday-school Society, all of which have headquarters at 25 Beacon Street, Boston. The nineteenth biennial national conference of Unitarian and other Christian churches, at Saratoga, N. Y., September 23-26, was marked by noteworthy addresses presenting various phases of the church life in retrospect and prospect. A review of the work of the different societies indicated their activity in promoting denominational interests; progress, especially in New Jersey and the South, was noted; generous gifts to the theological seminary were reported; and it was decided to raise \$50,000 for the erection of “Edward Everett Hale House” at the recently founded Hackley School, Tarrytown, N. Y. The committee appointed two years before to confer with the Universalists for closer cooperation made no

report. (See UNIVERSALISTS.) Hon. Carroll D. Wright, as president of the conference, succeeded Senator Hoar, whose resignation after a long term of service was reluctantly accepted. Earlier in the year, delegates from the United States, as well as from India, Japan, and nearly all Europe, attended the seventy-sixth anniversary in London of the British and Foreign Unitarian Association, a convention notable for the first meeting of the newly organized International Unitarian Council.

American Unitarian Association.—Founded in 1825, this body has performed an efficient service in carrying on the executive work of the church. The seventy-sixth annual meeting in Boston was occupied by consideration of its accomplished work and plans for future effectiveness in relation to the general interests of the church. The association maintains subordinate offices in New York and San Francisco, as well as headquarters in Boston. President, Rev. Samuel A. Eliot, D.D.; secretary, Rev. Charles E. St. John, 25 Beacon Street, Boston.

UNITED BRETHREN IN CHRIST, organized as a church in 1800, though founded in 1760, had in 1901 about 270,000 members, including the membership of the radical body (Old Constitution), that was founded in 1889 of opponents of the revised constitution to which the majority adhered. The more numerous body of the United Brethren reports, for 1901, 4,251 churches, with property valued at \$6,687,331; 2,393 ministers, and 244,667 members, a gain of 826 for the year; and total contributions of \$1,550,447, of which \$84,777 were received for missions. During the year four missionaries were sent to the Philippines and two to Porto Rico, and a medical missionary has been appointed to Canton, China. The church lost by death Bishop Jonathan Weaver, D.D. (*q.v.*), who had continuously since 1865 served in the episcopacy. A matter for congratulation has been the liquidation of a debt of \$50,000 on Western College, at Toledo, Ia., one of the more prominent institutions of the denomination. The most important event of the year was the meeting of the twenty-third general conference, at Frederick, Md., a centennial conference and one of unusual interest also, in that the church was formally organized but three miles from the city. The convention was marked by addresses noting the historical progress of the church and its activities, addresses that have since been issued by the publishing house at Dayton, O., in an attractive memorial volume. At this conference the rules were amended, making equal the representation of the clerical and lay elements in the assembly, thus accomplishing the final step in an evolution from a conference originally composed of ministers only.

UNITED EVANGELICAL CHURCH dates its organization from the year 1891, when, owing to disputes of rival conferences, its adherents withdrew from the Evangelical Association (*q.v.*). The church reports for 1901 a total membership of 62,523—a gain during the year of 1,530—with 797 churches, 493 ministers, and 215 local preachers; and 877 Sunday-schools, with 11,795 officers and teachers and 79,740 scholars. It has property valued at \$2,607,488; missionary contributions (1901) aggregated \$76,173; and \$121,603 were devoted to the construction and repair of church edifices and parsonages. These statistics uniformly show a very fair progress during the year. The United Evangelical Church maintains four colleges, and has a publishing house at Harrisburg, Pa., among the periodical issues of which is *The Evangelical*, a representative denominational paper.

UNITED PRESBYTERIAN CHURCH OF NORTH AMERICA, organized in 1858 from a union of Associate and Associate Reformed churches. At the meeting of the general assembly in Des Moines, Ia., in May, 1901, the opposition of the church to secret societies was clearly defined by the adoption of the judiciary committee's report upon a change of creed, which is interpreted to mean the exclusion of secret-society adherents from church membership, and virtually to disqualify some present members because of society affiliations. The United Presbyterians report for 1901 a membership of 130,447, a substantial growth during the year; 1,017 ministers; and 995 congregations, comprised in the 68 presbyteries and 13 synods. There are 1,208 Sunday-schools, with 12,989 officers and teachers, and attended by 120,032 scholars. Contributions aggregated \$1,726,880. The church carries on active home and foreign missionary work, and maintains 8 colleges and 5 theological seminaries, 2 institutions of each class being in Egypt and India. The publishing house of the denomination is at Pittsburgh, Pa.; *The United Presbyterian* is a representative periodical. Moderator of the assembly, Rev. J. A. Thompson, D.D.; principal clerk, Rev. William J. Reid, D.D., 244 Oakland Avenue, Pittsburgh.

UNITED SOCIETY OF CHRISTIAN ENDEAVOR. See CHRISTIAN ENDEAVOR, UNITED SOCIETY OF.

UNITED SOCIETY OF FREE BAPTIST YOUNG PEOPLE. See FREE BAPTIST YOUNG PEOPLE, UNITED SOCIETY OF.

UNITED STATES. The total area belonging to, or under the jurisdiction of, the United States is estimated by the United States Coast and Geodetic Survey to be 3,731,900 square miles, divided as follows: United States, 3,025,600; Alaska,

577,390; Philippine Islands, 119,000; Hawaiian Islands, 6,250; Porto Rico, 3,530; Guam Island, Tutuila Island, and Midway Island, 220. The total population, including Alaska, Hawaii, and other territories, but excepting Porto Rico and the Philippines, is given by the census of 1900 at 76,304,799, and was estimated by the government actuary on June 1, 1901, to be 77,647,000.

Agriculture.—The harvests for 1901 showed a falling off from the previous year in every crop of importance, with the exception of wheat. The corn crop suffered the most seriously, the yield per acre being 2.2 bushels below that for 1881, which had stood for twenty years as the lowest recorded. In Kansas, Missouri, and Nebraska, where the drought affected the corn most seriously, the yield per acre was put, respectively, at 7.8 bushels, 10.1 bushels, and 14.1 bushels. The yield throughout the country per acre was placed at 16.4 bushels, as against an average of 25.3 bushels in 1900 and an average for the ten years 1890-1900 of 24.4 bushels. In other crops the losses were similar, though not so serious. The average yield of potatoes per acre declined from 80.8 bushels in 1900 to 59.9 bushels in 1901; the oat crop declined from 29.6 bushels in 1900 to 25.1 bushels; and other crops suffered in like manner. On the other hand, the wheat crop was probably the largest ever harvested, the production in 1901 being estimated roughly at 677,000,000 bushels, as compared with 522,000,000 bushels in 1900 and 675,000,000 bushels in 1898, the latter being the largest output recorded down to that time. But even with the extraordinarily large production of wheat, the total output of the five largest agricultural crops—corn, wheat, oats, barley, and rye—was estimated by the *Commercial and Financial Chronicle* to have fallen 728,000,000 bushels below the corresponding totals for 1900 and 1899. Nevertheless, the small crops did not indicate an entire loss to the farmer, for the price of the agricultural products rose, both for domestic use and for export. This is shown from the fact that the total exports of bread-stuffs for the calendar year 1901 were valued at \$276,404,299, as against \$250,786,080 in 1900, a gain over the latter year of nearly \$26,000,000. It is true that a part of this gain may be accounted for by the unusually large exports of wheat and flour, which were about 40,000,000 bushels more than had ever been exported before. At the same time the export price of wheat was higher in 1901 than in the previous year, being 72.5 cents per bushel in 1901, as against 71.75 cents in 1900. Corn shipments amounted in 1901 to 102,359,089 bushels, as against 190,386,489 bushels in 1900; but the value of the exported corn in 1901 amounted to \$50,361,388, as against \$84,284,733 in 1900, thus showing that the average price of export corn had risen very largely; in fact, it was 49.2 cents per bushel, as against 44.3 cents in 1900 and 37.3 cents in 1898. The amount of oats exported was 25,929,048 bushels in 1901, as against 32,160,642 bushels in 1900; but the value of the oats was approximately \$9,000,000 in 1901 and \$9,800,000 in 1900, showing again a large increase in the average export price. Besides the increase in the value of exports of bread-stuffs, there was also an increase in the exports of animals and animal products, and in provisions and dairy products; the latter two exports increased from \$186,568,735 in 1900 to \$206,931,309 in 1901, and the former increased from \$35,033,734 to \$39,290,067. In both cases the increase in values was due in part to the higher prices prevailing and in part to an increase in the quantity exported. Cotton exports decreased from \$314,252,586 in 1900 to \$300,985,383 in 1901, the difference being almost entirely due to a smaller average price. In the same way the value of petroleum exports fell from \$74,493,707 in 1900 to \$72,784,886 in 1901; yet 1,051,206,172 gallons were exported in 1901, as against 967,106,478 gallons in 1900, thus showing a considerably lower average price of export, doubtless due in a large part to the effect upon the market of the exploitation of the oil discoveries in Texas and California. For correlated subjects, see paragraph Commerce; and see also articles AGRICULTURE; WHEAT; CORN; COTTON, etc.

Public Domain.—On June 1, 1901, the acreage of the public domain, including Alaska and excluding the new insular possessions, was 1,809,539,840 acres, of which 914,096,974 acres were undisposed of, 147,356,902 were reserved for various purposes, and 748,085,964 were appropriated or embraced in filings, school gifts, etc. See articles, LANDS, PUBLIC; FORESTRY; and PHILIPPINES.

Commerce.—There was much interest manifested throughout the country in 1901 concerning the condition of the American foreign trade, and much curiosity was everywhere expressed as to whether the figures for United States commerce in 1900 would be maintained in 1901. This interest and curiosity followed from the fact that in 1900 both the exports and the total commerce of the United States largely exceeded that for any other year; in fact, so largely did the figures exceed those of past years, that it was confidently asserted in many quarters that the era of prosperity in the United States which had begun in 1897 had reached its high-water mark by the end of 1900, and that the following year would show a marked decrease both in domestic manufactures and in foreign exports. These apprehensions, however, proved unfounded, and though the exports of the United States decreased by about \$12,000,000, the imports increased by some \$51,000,000, thus making the total figures

for the United States commerce in 1901 larger by some \$39,000,000 than in 1900. At the same time, the domestic production of manufactures of steel and iron and the output of coal and other staple articles showed no signs of diminution. In fact, the domestic demand for them was so great that but small attention was given to their export. (See articles, IRON AND STEEL; COAL; MANUFACTURES; and FINANCIAL REVIEW.) The continued prosperity evidenced by this was more remarkable on account of several disturbing elements which appeared in the financial and commercial interests of the United States. The most important of these was the great curtailment, through drought, of the agricultural crops, described in the preceding paragraph. Among other disturbing conditions were the steel strike (see STRIKES), the assassination of President McKinley (see MCKINLEY, WILLIAM), the corner in Northern Pacific Railroad shares, and the sharp break in the securities of the Amalgamated Copper Company. (See article FINANCIAL REVIEW.) While these events alone would have ordinarily tended to disturb prices and check an unusually large demand and production of manufactured articles, there were other disturbing trade tendencies, resulting from the commercial situation in Europe. The financial and industrial crisis which began in Germany in 1900 reached a more acute stage in 1901, so that German manufacturers were commonly compelled to sell for any price they could get, thus leaving a much smaller margin than usual for imports into Germany. At the same time, industrial conditions were similarly if not equally disturbed in Russia, Roumania, Belgium, and some of the Scandinavian countries. France had lost heavily in industrial enterprises, both at home and abroad, and a large amount of English capital was tied up, owing to the South African War and the issue of large loans by the imperial government. Thus there was plausible reason to believe that the United States' foreign commerce in 1901, on account of events both at home and abroad, would be much curtailed. As a matter of fact, however, the value of practically all exports increased considerably, with the exception of those in iron and steel, which declined from \$129,633,480 to \$102,539,797, and those in copper, which declined from \$57,542,610 to \$33,534,899. These decreases were both largely due to the industrial condition in Germany, although the surplus of copper in the United States, which had been steadily accumulating for two or three years, contributed to the result. In these two exports there was a net decline of \$51,000,000, while the total exports of the United States declined only \$12,000,000, thus showing an increase in all other exports of \$39,000,000.

Of the largest exports in 1901 may be mentioned bread-stuffs, which increased from \$250,786,080 in 1900 to \$276,404,299 in 1901; cotton and manufactures of cotton, which declined from \$314,252,586 in 1900 to \$300,985,383 in 1901; and provisions, which increased from \$186,568,735 in 1900 to \$206,931,309 in 1901. Of the largest imports and their value, may be mentioned coffee, imported to a value of \$59,510,771 in 1900, and to a value of \$70,156,044 in 1901; cotton and manufactures of cotton, which amounted to \$42,610,284 in 1900 and \$41,019,955 in 1901; fibres and manufactures of fibres, amounting to \$32,528,378 in 1900 and \$36,405,537 in 1901; chemicals, amounting \$53,480,424 in 1900 and \$56,772,488 in 1901; hides and skins, amounting to \$51,587,993 in 1900, and \$55,565,388 in 1901; rubber and gutta-percha, amounting to \$28,577,789 in 1900 and \$28,120,218 in 1901; jewelry, which increased from \$15,995,088 in 1900 to \$27,464,637 in 1901; unmanufactured silk, amounting to \$32,453,659 in 1900 and \$40,267,786 in 1901; manufactured silk, amounting to \$29,719,565 in 1900 and to \$29,260,550 in 1901; sugar, amounting to \$91,742,493 in 1900 and \$79,619,806 in 1901.

The total value of imports of merchandise in 1900 was \$829,149,714, while in 1901 the value of imports had risen to \$880,421,056. Of this latter amount, merchandise to the value of \$381,513,620 was admitted free of duty, while \$498,907,436 paid duty. The duties collected amounted to \$243,329,967, or, roughly speaking, 50 per cent. of the value of all dutiable imports. The total value of exports of merchandise in 1900 amounted to \$1,477,946,113, and in 1901 to \$1,465,380,919. Adding the exports and imports of each year respectively, a total commerce is shown in 1900 of \$2,307,095,287, and in 1901 of \$2,345,801,975.

Of the countries from which imports to the United States were derived, the United Kingdom led, the amount being \$155,291,927. Germany sent us imports to the extent of \$99,969,851, and imports from all Europe amounted to \$454,496,304, or over one-half of the total imports. From North America imports came to the amount of \$158,732,432; from South America to the amount of \$129,384,181, and from Asia to the amount of \$125,093,643. Of the exports of the United States, Europe took over two-thirds, while the United Kingdom and Germany together took over one-half of the United States' total exports. The United Kingdom alone took considerably over one-third of all the United States' exports, the amount being \$598,766,799. Germany followed with \$184,678,723, while Europe as a whole took exports to the amount of \$1,099,574,016. The third best single customer of the United States was Canada, which took exports to the extent of \$107,496,522.

In the subjoined table, compiled from reports made by the Bureau of Statistics of the Treasury Department, are given the total imports and exports of merchandise by countries for the years 1891, 1900, and 1901. It will be seen from these tables that in ten years the United States' imports have increased only from \$828,320,943 to \$880,421,056, while in the same time the exports have increased from \$970,509,646 to \$1,465,380,919. In other words, the imports have remained practically stationary, while the exports have increased by about 50 per cent. Each of the intervening years has shown a large trade balance in favor of the United States, the balance in 1897 being \$382,692,806; in 1898, \$645,247,542; in 1899, \$499,118,369; in 1900, \$674,917,720; and in 1901, \$609,451,982. If to the excess of merchandise exports over imports be added the excess of specie exports, we have for the six years since 1897 an excess of total exports in the sum of \$2,965,671,322. What has become of this enormous trade balance appears not to be definitely known. No holdings and subsequent sale of American securities abroad seems large enough to account for it, nor is it believed that interest on American securities held abroad, or the amount of money spent by American travelers is sufficient to make up the total. In fact, the manner of distribution and equalization of the trade balance of the United States appears to be largely a matter of conjecture, much more so, indeed, than is the manner in which the yearly trade balance against England is equalized.

It will be seen also from the subjoined table that our imports from Europe have increased but slightly within ten years, while from all North and South America they have slightly diminished. On the other hand, imports from Asia have increased from \$80,451,865 to \$125,093,643. Exports from the United States to Germany have doubled within ten years, while to the United Kingdom they have hardly kept pace with the relative increase of the total exports. To Canada, also, the exports have more than doubled, and the same may be said of Mexico, while to Asia exports have nearly tripled. Exports to Oceania have increased by the relatively great amount of nearly \$17,000,000, while to Africa they have increased from \$5,125,995 to \$20,652,093. On the other hand, exports to South America have increased very slowly, the amount having increased only from \$33,425,165 to \$42,557,504. That South America is abundantly able to take exports from the United States to thrice the value that she now does is not gainsaid, but owing to the lack of proper transportation facilities and to the enterprise of Europeans, and more especially Germans, the rapidly increasing South American trade has been kept almost entirely from the United States. For a discussion of American competition in Europe, and more especially in England, see GREAT BRITAIN (paragraph Trade and Commerce).

United States Foreign Trade by Countries.—The following table, compiled from figures prepared by the Treasury Department, shows the foreign trade of the United States by countries for the calendar years 1891, 1900, and 1901. By making a comparison over an interval of ten years some of the permanent changes and tendencies of the foreign trade of the United States are made apparent, while the comparison also instituted between the years 1900 and 1901 shows those more immediate changes which depend largely upon temporary conditions.

COUNTRIES.	IMPORTS BY COUNTRIES.			EXPORTS BY COUNTRIES.		
	1891.	1900.	1901.	1891.	1900.	1901.
<i>Europe.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>
Austria-Hungary.....	11,136,545	10,548,698	10,042,401	1,235,504	7,657,019	6,843,960
Azores and Madeira Islands...	26,815	24,638	27,071	414,812	540,663	318,329
Belgium.....	11,115,455	14,602,542	14,919,071	41,448,259	46,929,363	51,444,316
Denmark.....	234,222	796,736	661,246	5,455,740	15,499,371	18,490,616
France.....	68,158,819	72,781,212	81,814,609	91,781,316	62,553,335	78,405,972
Germany.....	90,773,484	108,456,554	99,969,851	90,326,392	197,603,400	184,678,725
Gibraltar.....	113,148	38,067	59,878	495,218	618,415	597,184
Greece.....	1,362,365	1,077,504	1,447,303	161,427	327,599	266,236
Greenland, Iceland, etc.....	76,379	72,763	70,886	.....	50	842
Italy.....	21,815,216	27,061,126	27,631,248	14,447,004	36,731,704	34,046,301
Malta, Gazo, etc.....	.....	15,040	16,083	.....	335,643	342,722
Netherlands.....	3,677,697	17,273,111	21,376,338	31,261,726	83,721,501	85,643,804
Portugal.....	1,876,719	3,349,110	3,641,452	4,479,294	5,705,179	4,544,088
Roumania.....	.....	101,042	289	50,482	31,037	35,509
Russia, Baltic and White Seas.	3,666,764	5,735,228	5,530,927	4,054,615	7,362,314	4,919,790
Russia, Black Sea.....	1,991,864	2,161,802	1,708,193	1,345,742	1,116,636	1,585,067
Servia.....	.....	3,156	30,129	.....	399	.....
Spain.....	4,806,475	5,538,662	7,040,758	12,887,477	15,200,917	16,785,711
Sweden and Norway.....	3,626,361	4,369,964	3,892,217	6,445,008	11,520,574	11,088,391
Switzerland.....	13,015,414	17,447,937	16,038,278	44,004	297,268	232,336
Turkey in Europe.....	1,852,603	3,596,806	4,102,149	19,239	406,217	527,301
United Kingdom.....	170,638,117	151,566,743	155,291,927	482,296,796	602,221,875	598,766,798
Total Europe.....	415,060,402	441,610,461	454,496,304	788,649,610	1,116,399,624	1,099,574,916

COUNTRIES.	IMPORTS BY COUNTRIES.			EXPORTS BY COUNTRIES.		
	1891.	1900.	1901.	1891.	1900.	1901.
<i>North America.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>
Bermuda.....	96,530	466,545	499,932	435,565	1,239,304	1,994,052
British Honduras.....	237,432	185,468	268,869	498,069	669,374	832,939
<i> Dominion of Canada:</i>						
Nova Scotia, New Brunswick, etc.....	5,900,819	5,787,398	6,390,873	4,007,395	7,042,866	6,230,243
Quebec, Ontario, etc.....	27,600,870	26,965,390	30,122,842	35,625,555	88,160,712	98,097,972
British Columbia.....	3,049,983	7,699,102	8,682,574	2,053,932	7,693,119	8,168,307
Total Dominion of Canada.....	36,551,672	40,441,890	45,325,789	41,686,882	102,896,697	107,496,522
Newfoundland and Labrador..	366,930	403,306	571,487	1,441,872	1,881,629	2,102,173
<i>Central American States:</i>						
Costa Rica.....	2,393,977	2,959,439	3,196,231	1,363,718	1,688,670	1,688,754
Guatemala.....	2,648,866	2,190,145	4,180,417	1,996,193	1,123,418	1,522,338
Honduras.....	1,178,913	1,114,466	1,269,229	552,660	1,126,832	1,109,546
Nicaragua.....	1,790,613	1,739,747	2,199,313	1,406,620	1,787,399	1,964,518
Salvador.....	1,568,938	746,936	1,111,414	1,355,299	756,566	799,191
Total Central Am. States..	9,581,307	8,740,733	11,956,604	6,673,390	6,467,905	6,484,347
Mexico.....	28,910,147	28,179,829	35,281,633	15,371,370	38,270,933	36,771,568
Miquelon, Lanley, etc.....	96	51,276	50,567	402,680	198,355	191,602
<i>West Indies:</i>						
British.....	13,278,004	12,397,536	12,688,249	8,821,300	8,630,347	9,230,139
Cuba.....	69,278,511	31,747,229	46,663,796	14,464,559	25,934,524	27,007,024
Danish.....	215,582	444,050	699,379	559,872	651,996	686,482
Dutch.....	110,385	241,535	227,581	784,184	631,339	620,804
French.....	20,457	31,493	9,606	1,916,245	2,008,756	2,765,987
Haiti.....	3,157,208	1,357,775	1,127,641	5,215,021	3,720,279	1,956,343
Porto Rico.....	3,042,951	2,443,995	.....	2,549,857	2,813,821	.....
Santo Domingo.....	1,469,868	3,228,849	3,361,319	989,910	1,782,760	1,700,371
Total West Indies.....	90,572,906	51,892,462	64,777,671	35,250,848	47,173,822	43,967,150
Total North America.....	166,317,020	130,361,453	168,732,432	101,760,676	198,788,019	199,240,353
<i>South America.</i>						
Argentina.....	5,725,220	8,098,343	9,455,634	1,909,788	11,095,538	11,117,521
Bolivia.....	.....	22	26	15,735	120,033	111,580
Brasil.....	100,041,601	94,914,507	79,850,725	15,064,346	11,516,681	11,138,101
Chile.....	2,905,815	7,474,061	9,236,009	2,787,001	4,596,525	4,809,244
Colombia.....	4,596,579	8,080,427	8,544,395	3,283,702	2,605,544	3,304,190
Ecuador.....	756,365	1,577,486	1,421,563	827,607	1,590,055	1,822,955
Falkland Islands.....	.....	.....	.....	.....	461	1,008
Guianas: British.....	5,513,922	4,656,613	3,436,998	1,860,722	1,879,847	1,767,067
Dutch.....	754,416	1,321,340	1,351,110	385,272	555,726	538,847
French.....	88,790	54,812	44,048	154,298	211,764	251,023
Paraguay.....	.....	1,740	.....	.....	8,487	16,155
Peru.....	854,815	2,910,531	3,416,178	1,139,718	2,311,886	3,148,610
Uruguay.....	1,623,136	2,086,893	1,974,977	955,480	1,738,742	1,480,890
Venezuela.....	12,018,334	6,589,858	7,153,620	5,141,521	3,016,762	3,062,398
Total South America.....	134,168,993	102,706,633	120,384,161	33,425,165	41,248,051	42,557,504
<i>Asia.</i>						
Aden.....	.....	1,616,981	1,560,501	.....	851,735	1,984,288
Chinese Empire.....	21,229,212	22,940,397	18,125,836	8,031,606	11,081,146	18,178,484
China: British.....	.....	81	822	.....	.....	5,582
German.....	.....	.....	.....	.....	.....	2,271
Russian.....	.....	.....	1,117	.....	160,320	703,158
East Indies: British.....	23,566,488	43,328,204	47,171,558	3,530,234	5,227,082	5,646,689
Dutch.....	7,639,643	20,887,680	15,343,948	1,165,103	1,994,858	2,210,963
French.....	14	.....	3,914	48,567	118,102	49,113
Portuguese.....	.....	529	.....	.....	1,084	.....
Hong Kong.....	617,519	1,296,771	1,299,722	4,812,694	9,378,239	8,058,873
Japan.....	23,914,123	26,315,235	36,854,692	3,839,384	26,492,111	21,192,477
Korea.....	.....	740	21,559	.....	130,297	933,375
Russia, Asiatic.....	.....	1,106	26,637	182,336	2,786,604	1,013,320
Turkey in Asia.....	2,976,814	3,657,834	4,092,386	208,360	217,016	157,903
All other Asia.....	178,970	337,661	591,846	256,983	282,679	265,267
Total Asia.....	80,451,865	120,378,219	125,098,643	22,075,267	58,726,173	59,068,723
<i>Oceania.</i>						
British Australasia.....	7,407,577	5,262,962	4,839,128	13,564,921	28,164,722	30,569,814
British Oceania.....	.....	1,947,277	1,391,246	.....	206,071	97,873
French Oceania.....	306,109	499,532	834,312	377,716	849,875	406,203
German Oceania.....	.....	6,002	11,652	.....	43,365	19,886
Spanish Oceania.....	.....	2,364	.....	.....	39,006	16,925
Hawaii.....	11,644,163	9,253,556	.....	4,876,090	7,474,961	.....
Philippine Islands.....	5,649,151	6,085,949	3,737,071	46,382	3,523,146	4,173,397
All other.....	.....	.....	.....	.....	.....	4,142
Total Oceania.....	25,010,005	23,067,642	10,813,409	18,865,111	39,805,176	35,288,230

COUNTRIES.	IMPORTS BY COUNTRIES.			EXPORTS BY COUNTRIES.		
	1891.	1900.	1901.	1891.	1900.	1901.
<i>Africa.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>
British Africa.....	937,908	1,187,823	910,703	8,511,668	19,190,658	24,994,766
Canary Islands.....	72,672	21,070	99,385	313,453	270,380	261,972
French Africa.....	588,919	478,893	480,316	473,243	926,550	511,474
German Africa.....	.....	.....	50	.....	2,757	8,792
Liberia.....	13,946	4,351	2,900	59,808	27,355	33,985
Madagascar.....	94,157	4,485	547	116,898	23,486	16,202
Portuguese Africa.....	1,902	4,798	6,659	41,906	837,368	2,469,085
Spanish Africa.....	.....	750	11,853	.....	13,222	363
Turkey in Africa.....	2,543,939	8,724,751	9,048,578	147,464	1,625,487	1,321,145
All other Africa.....	1,259,440	652,385	400,096	461,540	155,907	13,689
Total Africa.....	5,512,880	11,025,306	10,901,087	5,125,995	22,979,170	29,652,093
<i>All Other Countries</i>						
British, all other..... ^c	1,725,434	.....	.....	493,196	.....	.....
Spanish, all other..... ^d	2,868	.....	.....	.....	.....	.....
All other islands and ports..... ^e	71,478	.....	.....	114,676	.....	.....
Total all other countries.....	1,799,778	.....	.....	607,822	.....	.....
Grand total.....	828,320,943	829,149,714	880,421,056	970,508,646	1,477,946,113	1,465,380,919
<i>Recapitulation.</i>						
Europe.....	415,080,402	441,610,461	454,496,304	788,649,610	1,116,399,624	1,090,574,016
North America.....	166,317,020	130,361,453	158,732,432	101,760,676	198,788,019	199,240,353
South America.....	134,168,993	102,706,638	120,384,181	33,426,165	41,248,051	42,557,504
Asia.....	80,451,865	120,378,219	125,093,643	22,075,267	68,726,173	69,068,723
Oceania.....	25,010,005	23,067,642	10,813,409	18,866,111	39,806,176	35,286,230
Africa.....	5,512,880	11,025,306	10,601,087	5,125,995	22,979,170	29,652,093
All other countries.....	1,799,778	.....	.....	607,822	.....	.....

^a Six months ending June 30, 1900.

^b Six months ending June 30, 1900.

^c Previous to 1896 includes: Malta, Gozo, etc.; Falkland Islands; Aden; Auckland; Fiji, etc.

^d Previous to 1896 includes: Spanish Oceania; German Oceania, and Africa.

^e Previous to 1896 includes: Tonga, Samoa, etc.

Colonial Trade.—As seen from the subjoined table, the colonial trade of the United States shows a considerable increase for 1901. Among the imports from Cuba, the largest increases are shown in the case of sugar cane (\$18,243,679 in 1900 and \$26,373,690 in 1901); leaf tobacco (\$7,622,333 in 1900 and \$9,830,823 in 1901); and manufactures of tobacco (\$2,081,998 in 1900 and \$2,301,949 in 1901). Of the exports from the United States to Cuba, bread-stuffs show an increase from \$2,914,870 to \$3,180,232; provisions, iron and steel and their manufactures show only a slight increase, while animals show a decrease. Among the imports from Porto Rico, sugar shows an increase of from \$2,449,616 to \$4,924,694. There is a falling off in the imports of tobacco leaf and an increase in the import of manufactured tobacco products. Among the exports to Porto Rico, cotton cloth shows the remarkable increase from \$280,543 to \$1,170,286, and rice from \$153,882 to \$1,309,725. The falling off in the imports from the Philippines is shown mainly in the case of fibres, vegetables, manila, and sugar. Among the exports from the United States to the islands, the largest increase is shown in the case of bread-stuffs, spirits, malt liquors, and iron and steel manufactures. About 50 per cent. of the imports from Cuba to the United States and over 50 per cent. of the exports were carried in American vessels. In the Porto Rican trade with the United States American vessels were engaged exclusively.

	CUBA.		PORTO RICO.		PHILIPPINES.	
	Exports.	Imports.	Imports.	Exports.	Imports.	Exports.
1898.....	\$15,232,477	\$9,561,656	\$2,414,356	\$1,505,946	\$3,830,415	\$ 127,804
1899.....	25,411,410	18,615,707	3,179,826	2,685,848	4,410,774	404,171
1900.....	31,371,704	25,235,892	3,078,415	4,260,892	5,971,308	2,635,624
1901.....	43,418,727	24,100,453	5,883,892	6,861,917	4,420,289	4,014,180

See CUBA; HAWAII; PHILIPPINES, and PORTO RICO.

Industries.—See MINERAL PRODUCTION; MANUFACTURES; IRON AND STEEL; COTTON AND THE COTTON INDUSTRY; SUGAR INDUSTRY; CUBA (paragraph The Sugar Question); RAILWAYS; SHIP-BUILDING; SILK INDUSTRY; WOOL. A discussion of some correlated subjects will be found in the articles, ARBITRATION, LABOR; INDUSTRIAL COMMISSION; LABOR; STRIKES; TRUSTS; UNITED STATES STEEL CORPORATION.

Posts.—The report of the postmaster-general for the fiscal year ending June 30, 1901, showed that the receipts of the Post-office Department during the year amounted to \$111,631,193.39 and the expenditures to \$115,554,920.87, leaving a deficit of \$3,923,727.48. As compared with the previous year, the receipts were greater by over \$9,000,000 and the expenditures by less than \$8,000,000, thus reducing the deficit in the sum of \$1,461,961.22. As in his previous reports, the postmaster-general discussed at length the abuse of regulations governing second-class mail matter, by publishers and others who circulated "trade journals," "house organs," "sample copies," etc., in serial form in order to secure the advantage of the rate of 1 cent a pound, which is about one-seventh of the actual cost of handling and transportation, and turns a normal surplus of several million dollars a year in the Post-office Department into a considerable deficit. Second-class mail matter constitutes by weight nearly 60 per cent. of the entire mail of the country, and its cost of transmission cannot be estimated at less than one-fourth of the entire cost of the mails, or \$28,888,730. But the revenue from second-class matter was \$4,294,445 in 1901, leaving an actual net cost and loss to the government of \$24,594,285. Now, so far as this loss is incurred in distributing *bona fide* periodicals, containing general or special information of value to subscribers, it is authorized by Congress and is a part of the national policy of rendering the advantages of knowledge and education accessible to all. But of the enormous total of second-class matter, it is estimated by experts that at least one-half, entailing a loss to the Post-office Department of \$12,000,000 annually, is wholly illegitimate and outside the intent of the law. While many of the evasions of the law cannot be checked without corrective legislation, which is urgently recommended, various open violations of the law were attacked by the postmaster-general in an order of July 17, 1901, excluding from the second-class rate books and novels issued in serial form, unsold periodicals when returned to the publishers, and some of the most obvious advertising schemes worked by the means of "periodicals," so called.

Rural Free Deliveries.—In his annual report, the postmaster-general stated that the extension of rural free delivery had been going on with increasing strides during the year. The number of rural routes in operation at the beginning of the fiscal year 1901 was 1,276, and at its close, 4,301, while it was estimated that by July 1, 1902, the number of free delivery routes would be increased to 8,600. It was estimated that these 8,600 routes would reach some 5,700,000 rural residents out of a population of 21,000,000, to whom it was believed the system could profitably be extended. The wisdom of rural deliveries was stated by the postmaster-general to be no longer an open question, for it had been made plain that this delivery brought agricultural life into far closer relations with the active business world; that it kept the farmer in daily touch with markets and prices; that it advanced general intelligence by the increased circulation of legitimate journals; that it quickened all interchanges, promoted good roads, enhanced farm values, and made farm life less isolated and more attractive than it could otherwise be. Moreover, the popular appreciation of this service was shown by the fact that, whereas, under the old conditions the annual rate of growth in the rural communities was about 2 per cent., it increased annually from 8 per cent. to 10 per cent. whenever rural delivery was instituted.

Navigation.—The report of the commissioner of navigation shows that on June 30, 1901, the merchant marine of the United States, including all kinds of documented shipping, comprised 24,057 vessels of 5,524,218 tons. By the end of the year this tonnage had increased so as to exceed the former maximum of 5,539,813 gross tons in 1861. The total is surpassed only by that of the United Kingdom, with 14,064,152 gross tons, Germany's shipping aggregating 3,244,208 gross tons. But while not only Great Britain and Germany, but France, Italy, and Japan, maintain many lines of large and fast steamers engaged in foreign commerce, American vessels are almost wholly engaged on the lakes, rivers, and harbors of the United States or in the coastwise trade. For the fiscal year 1901, American vessels carried the smallest percentage (8.2 per cent.) of American exports and imports in the history of the country. The trans-oceanic trade requires much larger steamers than those usually built in the United States, and it may be seen from the fact that while the average size of all United States steam vessels in 1901 was 1,210 gross tons, the average size of German steamers was over 1,800 gross tons. The increase in the registered tonnage for the fiscal year 1901 was 62,435 tons, which represented an increase in steam tonnage of 88,380 and a decrease in sail tonnage of 25,945 tons. Included in the registered steam tonnage of the United States are many small wooden steamers on the Yukon, tugs, steam whalers, and other small vessels. For trans-oceanic trade, steel steamers of 1,000 tons and upward are necessary. Of such vessels registered for foreign trade the United States had in 1901, 113, aggregating 353,281 gross tons. At the same time, the corresponding British fleet was about thirty times larger, the German fleet six times, and the French fleet twice as large. For the fiscal year ending June, 1902, the commissioner of navigation estimated that

vessels would be constructed to an aggregate tonnage of 488,700, of which tonnage 186,000 was intended for the Great Lakes. The total tonnage of 488,700 represents vessels for the government, as well as for the merchant marine. Of merchant vessels, 89 of steel were being constructed or were under contract on July 1, 1901, having 355,645 gross tons. At the beginning of the fiscal year 1900 68 steel steam vessels were being constructed of 277,680 tons. The following table shows the geographical distribution, motive power, and material of construction and trade of vessels of the United States for the fiscal year 1901, compared with the fiscal year 1900, and shows also the construction for the two years:

	1900.		1901.	
	Number.	Gross tons.	Number.	Gross tons.
Geographical Distribution:				
Atlantic and Gulf coasts.....	16,592	2,727,892	16,774	2,849,342
Porto Rico.....			25	5,297
Pacific coast.....	2,308	601,212	2,387	676,682
Hawaiian Islands.....	14	11,692	64	37,149
Northern lakes.....	3,187	1,565,587	3,253	1,706,294
Western rivers.....	1,417	258,456	1,584	249,454
Total.....	28,383	5,164,839	24,067	5,524,218
Motive Power:				
Steam.....	7,068	2,687,797	7,414	2,920,963
Sail.....	16,280	2,607,042	16,543	2,608,265
Canal boats and barges.....	3,009	622,300	3,412	689,908
Construction During the Year:				
Atlantic and Gulf coasts.....	804	207,652	823	236,948
Pacific coast.....	303	41,354	271	54,568
Northern lakes.....	125	130,611	175	169,085
Western rivers.....	215	14,173	311	22,898
Total.....	1,447	393,790	1,580	483,489
Motive Power:				
Steam.....	422	202,528	506	273,591
Sail.....	504	116,480	526	126,165
Canal boats and barges.....	521	74,802	548	83,733
Total.....	1,447	393,790	1,580	483,489

Army.—The long-discussed Army Reorganization Bill, left pending when Congress adjourned on June 7, 1900, owing to the imminence of the national election and the consequent desirability of minimizing at the time the so-called issue of imperialism, was promptly passed by Congress in amended form at the opening of the succeeding session, and became a law on February 2, 1901. The bill in its final shape followed explicitly the views of President McKinley as to the needed increase in the permanent military establishment, and followed to some extent the recommendations of the secretary of war looking toward army reform and the curtailment of abuses of long standing in the military service. The President stated in his annual message of 1900 that, in accordance with the provision of the law of March 2, 1899, under which the volunteer force had been enlisted, the existing army of 100,000 men would have to be reduced by June 30, 1901, to 2,447 officers and 29,025 enlisted men. But in the Philippines alone nearly double that number would be required in the immediate future, and some 40,000 men ought also to be held in the United States, besides small forces in Cuba and Porto Rico. The President recommended, therefore, that a regular army of 60,000 be established, with authority given to the President temporarily to increase this number to 100,000. Previously also, on February 19, 1900, the secretary of war had submitted a bill to Congress providing for radical alteration in the military organization. The bill proposed, in brief, first, that one-third of the promotions to the rank of major, lieutenant-colonel, and colonel should be made upon the basis of merit, in order to encourage specially efficient officers; secondly, that the President should be empowered to retire, in his discretion, heads of staff departments, in order that he might retain control of the great subsidiary departments which organize, clothe, and equip the army; thirdly, that permanent subordinate staff positions be abolished, and be replaced by appointments from the line, in order to quell the strong feeling throughout the army that the staff constituted a sort of hedged-in aristocracy, supported by political favor; fourthly, that the artillery should be materially increased over its present proportion to the cavalry and infantry forces, that a battalion formation should be substituted for the regimental formation of

artillery, and that the artillery forces be divided into a coast artillery and a field artillery, the one to be charged with the coast defense and the other with the light artillery naturally accompanying a moving army. To the President's recommendations for an increase in the army there appeared no objection in Congress; but to the recommendations of the secretary of war there was immediate and sustained objection, instigated and carried on, it was stated, by the staff departments, whose entrenched positions were threatened. While granting the secretary's request for a reorganization of the artillery arm of the service, Congress declined to go further in reducing the prestige of the staff departments than to prescribe that future vacancies occurring in the staff departments which could not be filled by those already holding permanent appointments, whose tenure of office and right to promotion was not to be disturbed, should be filled by officers detailed from the line, and that these latter officers should serve for four years on the staff, and should then be ineligible for further service on the staff until they had served at least two years in the line.

The other main provisions of the Army Bill, formulated in many of its sections by a compromise of conflicting interests, are as follows: The permanent army establishment is to consist of 30 regiments of infantry instead of, as formerly, 25; 15 regiments of cavalry instead of 10; 3 battalions of engineers instead of 1; and a corps of artillery equivalent to 13 regiments instead of, as formerly, 7 regiments of artillery. Maximum and minimum numbers of men may be enrolled in the different organizations, so that the total number of enlisted men may vary, as the President thinks wise, from 59,131 to 100,000, including in the latter, if it seems desirable, a regiment of Porto Ricans and 12,000 Filipinos. The artillery corps is to consist of the field artillery of 30 battalions and the coast artillery of 126 battalions, and to have an aggregate number of men not exceeding 18,920. The chief of artillery is to be selected by detail from among the colonels of artillery, and to serve on the staff of the general officer commanding the army. In order to provide for the large increase of commissioned officers necessitated by the increase of the army establishment, the secretary is authorized to appoint as first and second lieutenants, men who have served during or subsequent to the war with Spain, and have passed such examinations as are prescribed by the secretary of war. Congress also directed the secretary of war to make preliminary examinations and surveys for the purpose of selecting four sites, with a view to the establishment of permanent camp grounds, where troops of the regular army and national guard might receive instruction and perform evolutions in large bodies.

Owing to the rapid improvement of conditions in the Philippines, the secretary of war stated, in his annual report for 1901, that it had been deemed unnecessary to take full advantage of the provision authorizing the enrollment of 100,000 men, and that on May 8 an order had been issued which would in the near future fix the number of enlisted men at 77,287, composed as follows: Cavalry, 15,840; artillery, coast 13,734, field 4,800, non-commissioned staff and band 328, or a total for the artillery of 18,862; infantry, 38,520; engineer battalions and band, 1,282; enlisted men in the staff departments, 2,783. By September 25, however, the army had not been reduced to quite this figure, the total number, both of officers and enlisted men, being 84,513, distributed as follows:

Country.	Officers.	Enlisted Men.	Total.
United States	1,922	31,952	33,874
Philippine Islands	1,131	42,128	43,239
Cuba	166	4,748	4,914
Porto Rico	51	1,490	1,541
Hawaiian Islands	6	250	256
China	5	157	162
Alaska	17	510	527
Total	3,278	81,235	84,513

In this table were included the 4,336 men of the hospital corps and the 25 officers and 815 men of the Porto Rico provisional regiment, leaving the strength of the regular army 3,253 officers and 76,084 enlisted men. In addition there were also in the Philippines 172 volunteer surgeons, appointed under section 18 of the act of February 2, 1901, and 98 officers and 4,973 native scouts.

Army Canteen.—As a rider to the Army Reorganization Bill, Congress passed the following measure: "The sale of or dealing in beer, wine, or any intoxicating liquors by any persons in any post exchange or canteen or army transport, or upon any premises used for military purposes by the United States, is hereby prohibited." This abolition of the so-called army canteen followed directly from a temperance agitation of widespread extent, largely conducted by the Women's Christian Temperance Union. The army canteen was in effect the recreation room of the company or

regiment, in which, by previous army regulation, beer and light wines were permitted to be sold, the proceeds commonly being appropriated for the benefit of the mess; that is, for making improvements in the fare allotted by the government to the enlisted soldiers. The position of the advocates of temperance with regard to this canteen was, in the first place, that all dealing in liquor is immoral, and that the United States government, by authorizing this liquor traffic, became *particeps criminis*. Moreover, and from a practical standpoint, the prohibitionists urged that the majority of enlisted men were unaccustomed to drink when they entered the army, and that the presence of the canteen tended to turn them into drunkards in short order. On the other hand, the great body of army officers objected to the proposed change, stating that, in the first place, they themselves were permitted to drink when and where they chose, and that the enlisted soldiers should not be treated more hardly; that, in the second place, the improvements of the mess allowed by the proceeds of the canteen did much to keep the soldiers in a contented frame of mind; and that, third and most important, there are always on the outskirts of every army post saloons and evil resorts of the worst kind, and that it was much better for the soldiers to drink beer with their companions within the post than whisky with thieves and disreputable persons outside the post. Notwithstanding these arguments, however, adduced with varying emphasis by nearly all who had experience in the actual handling of troops, and notwithstanding, as was asserted, the real belief of Congress that the abolition of the canteen was unwise, the canteen was abolished in deference to the temperance movement. The secretary of war then directed that all commanding officers submit reports showing the effect of the new legislation during the year following. From a large number of these reports, as stated in the secretary's report for 1901, he believed the legislation to have been unfortunate. On the other hand, the lieutenant-general commanding the army stated, to the contrary, that he considered the legislation to have had no ill effect.

Navy.—During the year 1901 the following vessels were finally or conditionally accepted by the Navy Department: The battle-ships *Alabama* and *Wisconsin*, and the torpedo boats *Stockton*, *Bailey*, *Barney*, *Shubrick*, *Bagley*, and *Biddle*. There were also under construction at the time of the secretary's report 59 vessels of all classes. The total naval construction, excluding all colliers, transports, etc., under way in the United States and in the principal foreign countries at the time of the secretary's report, and also the authorized tonnage expected to be laid down during the fiscal year 1902, is shown in the following table:

Nations.	Battle-ships, Tons.	Cruisers, Tons.	Torpedo Vessels, Tons.	1901. Total, Tons.	1902. Total, Tons.
Great Britain	30,000	81,920	4,700	116,620	126,660
France .....	....	35,100	6,772	41,872	48,260
Germany	11,800	9,770	4,900	26,470	47,470
Italy .....	....	....	....	....	25,250
Japan .....	....	6,400	5,903	12,303	....
Russia	19,500	31,785	3,500	54,835	39,109
United States .....	....	23,000	849	23,840	....

In addition to the vessels already authorized or being built in the United States, the secretary recommended that Congress should authorize the construction of three first-class battle-ships, two first-class armored cruisers, three gunboats of about 1,000 tons each, three of about 200 tons displacement, three picket boats, three steel training ships, and a collier of about 15,000 tons.

The pressing need of increasing the personnel of the navy was again emphasized by the secretary. There were not, he said, enough men, either in the commissioned or enlisted ranks, to take to sea the vessels already constructed. In case of war, vessels not manned would be useless, and landsmen could not within a short time be trained either in the general habits or in the technical requirements necessary for the management of war vessels. Of all the considerable navies of the world that of the United States had the smallest personnel, having 23,453 men of all ranks and ratings, exclusive of marines, as against 25,804 in the Italian navy, 26,108 in the Japanese, 39,546 in the Russian, 30,386 in the German, 49,775 in the French, and 114,880 (including the royal marines) in the British. An increase of 3,000 men in the enlisted force was therefore recommended, as well as an increase of 50 per cent. in the corps of naval cadets. In addition, the establishment of a national naval reserve was advised, so as to make provision for the large number of extra men who would be imperatively needed in time of war. The secretary stated that in accordance with Congressional direction, new sites for naval stations had been examined by naval commissions, with the result that Olongapo, in Subig Bay, in the Philippines, and San Juan, in Porto Rico, were recommended as naval stations, and that condemnation suits had been begun for a naval station and harbor defenses at Pearl Harbor, in

the Hawaiian Islands. With reference to the long-argued question of the quality and relative value of the armor furnished to the government by private contractors, the secretary stated: "Comparing the armor tests made in this country with the reports of those made abroad, our armor seems to be the best that can at present be produced, and the price at which it is obtained is lower than that paid abroad."

Census, Immigration, Pensions, Railways, and Lands, Public.—See the special articles on those subjects.

Diplomatic Service.—No important changes were made during the year in the diplomatic service, except that Robert S. McCormick, of Illinois, replaced Addison C. Harris, of Indiana, as minister to Austria-Hungary. The following table shows the accredited diplomatic representatives of the United States at foreign courts on December 5, 1901, together with the year of their appointments, and shows also the representatives of foreign nations accredited at Washington:

COUNTRY.	AMBASSADORS.			
	Accredited to the United States.	Accredited by the United States.	Appointed from.	Date of appointment.
France.....	M. Jules Cambon.....	Horace Porter.....	New York..	1897
Germany.....	Herr Von Holleben.....	Andrew D. White.....	New York..	1897
Great Britain.....	Rt. Hon. Lord Pauncefoot.....	Joseph H. Choate.....	New York..	1899
Italy.....	Signor E. Mayor des Planches.....	George von L. Meyer.....	Mass.....	1900
Mexico.....	Señor Manuel de Aspiroz.....	Powell Clayton.....	Arkansas..	1897
Russia.....	Comte Cassini.....	Charlemagne Tower.....	Pa.....	1899
MINISTERS PLENIPOTENTIARY OR MINISTERS RESIDENT.				
Argentine Republic.....	Señor Don M. G. Mérou.....	William P. Lord.....	Oregon.....	1899
Austria-Hungary.....	Mr. L. H. von Hengervár.....	Robert S. McCormick.....	Illinois.....	1901
Belgium.....	Baron Ludovic Moncheur.....	Lawrence Townsend.....	Pa.....	1899
Bolivia.....	Señor Don F. E. Guachalla.....	George H. Bridgman.....	New Jersey..	1897
Brazil.....	Señor J. F. de Assis-Brasil.....	Charles Page Bryan.....	Illinois.....	1898
Chile.....	Señor Don Elidoro Infante*.....	Henry L. Wilson.....	Wash.....	1897
China.....	Mr. Wu Ting-Fang.....	Edwin H. Conger.....	Iowa.....	1898
Colombia.....	Señor Don C. M. Silva.....	Charles B. Hart.....	W. Virginia..	1897
Costa Rica.....	Señor Don J. Bernardo Calvo.....	William L. Merry.....	California..	1897
Denmark.....	Mr. Constantin Brun.....	Lawrie S. Swenson.....	Minnesota..	1897
Dominican Republic.....	Señor Don Feo. L. Vasquez.....	William F. Powell*.....	New Jersey..	1897
Ecuador.....	Señor Don Luis Felipe Carbo.....	Archibald J. Sampson.....	Arizona.....	1897
Greece, Servia, and Roumania.....	.....	Charles S. Francis.....	New York..	1901
Guatemala and Honduras.....	Señor Don Antonio L. Arriaga.....	W. Godfrey Hunter.....	Kentucky..	1897
Haiti.....	Mr. J. N. Léger.....	William F. Powell.....	New Jersey..	1897
Japan.....	Mr. Kogoro Takahira.....	Alfred E. Buck.....	Georgia.....	1897
Korea.....	Mr. Minhui Cho.....	Horace N. Allen.....	Ohio.....	1897
Liberia.....	.....	Owen L. W. Smith.....	N. Carolina..	1898
Netherlands.....	Baron W. A. F. Gevers.....	Stanford Newell.....	Minnesota..	1897
Nicaragua.....	Señor Don Luis F. Corea.....	William L. Merry.....	California..	1897
Paraguay.....	.....	William R. Finch.....	Wisconsin..	1897
Peru.....	General Isaac Khan.....	Lloyd C. Griscom.....	Pa.....	1901
Portugal.....	Mr. Manuel Alvarez Calderon.....	Irving B. Dudley.....	California..	1897
Salvador.....	Viscount de Santo-Thyrso.....	Francis B. Loomis.....	Ohio.....	1901
Siam.....	Señor Don Rafael Zaldivar.....	William L. Merry.....	California..	1897
Spain.....	Phya Prashiddhi.....	Hamilton King.....	Michigan..	1898
Sweden and Norway.....	Duke de Arcos.....	Bellamy Storer.....	Ohio.....	1899
Switzerland.....	Mr. A. Grip.....	William W. Thomas Jr.....	Maine.....	1897
Turkey.....	Mr. J. B. Floda.....	Arthur S. Hardy.....	N. H.....	1901
Uruguay.....	Chékib Bey.....	John G. A. Lelshman.....	Pa.....	1901
Venezuela.....	Dr. Juan Cuestas.....	William R. Finch.....	Wisconsin..	1897
	Señor Don F. A. Pulido*.....	Herbert W. Bowen.....	New York..	1901

* Chargé d'affaires.

Revenue and Expenditure.—The revenue of the government for the fiscal year ending June 30, 1901, was \$699,316,530.92, as against \$669,595,431.18 for the year previous, and the expenditures for 1901 were \$621,598,546.54, as against 590,068,371 in 1900. While in 1900, then, the excess of receipts over expenditures was \$79,527,060.18, in 1901 it was \$77,717,984.38. The largest sources of income were, from internal revenue \$307,180,663.77, from customs \$238,585,455.99, and from the postal service \$111,631,193.39. The main items of expenditure for the same period were: For the civil establishment, \$117,327,240.89; for the military establishment, including defense construction and the expenses of the war in the Philippines, \$144,615,697.20; for the naval establishment, including the building, armament, and equipment of new vessels, \$60,506,978.47; for pensions, \$139,323,621.99; for interest on the public debt, \$32,342,979.04; for the postal service, \$111,631,193.39; and for deficiency in the postal revenues, \$4,954,762.21. The main items of increased revenue in 1901 were: An increase from internal revenue, \$11,852,737.01; from customs receipts, \$5,420,584.83; and from the postal service, \$9,276,614.10. The main items of increased expenditure for

1901 were: For the military establishment, \$9,840,929.42; for the naval establishment, \$4,553,900.72; and for the civil establishment, \$18,784,829.52. The surplus, as in 1900, was due to a large extent to the marked prosperity of the country, the taxes producing unprecedentedly large returns, in spite of the revenue reduction made by Congress early in the year. For the fiscal year 1902 the secretary, in his report for 1901, estimated the revenues and expenditures, as based upon the laws in force at that time, at \$688,633,042 and \$588,633,042 respectively, the estimated surplus being thus \$100,000,000. The details of this estimate are given as follows:

From customs	\$250,000,000
From internal revenue.....	282,000,000
From miscellaneous sources.....	40,000,000
From postal service.....	116,633,042

Total estimated revenues..... \$688,633,042

The expenditures for the same period are estimated as follows:

For the civil establishment	\$110,000,000
For the military establishment.....	115,000,000
For the naval establishment.....	70,000,000
For the Indian service.....	11,000,000
For pensions	137,000,000
For interest on the public debt.....	29,000,000
For postal service.....	116,633,042

Total estimated expenditures..... \$588,633,042

Or a surplus of..... \$100,000,000

Classification of Cash in Treasury.		
Cash in Divisions of Issue and Redemption established by the Currency Act of 1900:		
Reserve fund of gold coin and bullion as fixed by law.....		\$150,000,000.00
Gold and silver coin and bullion held against outstanding gold and silver certificates and treasury notes.....		806,743,089.00
General Treasury Fund:		
Cash in vaults.....	\$143,197,519.43	
In national bank depositories.....	116,027,676.27	
		259,224,994.70
Total		\$1,215,968,083.70

Demand Liabilities		
Notes outstanding against gold and silver in Treasury Division of Redemption:		
Gold certificates.....	\$ 314,365,089.00	
Silver certificates.....	451,564,000.00	
Treasury notes.....	40,814,000.00	
		\$806,743,089.00
Other Liabilities:		
National bank 5 per cent fund.....	\$ 14,177,453.99	
Outstanding checks and drafts.....	8,631,336.56	
Disbursing officers' balances.....	57,412,353.47	
Post-office Department account.....	4,568,346.48	
Miscellaneous items.....	3,417,993.31	
		88,207,383.81
Reserve fund fixed by law.....	\$150,000,000.00	
Available cash balance.....	171,017,610.89	
		\$321,017,610.89
		\$1,215,968,083.70

The National Debt.—The amount and classification of the national debt of the United States on December 31, 1900, and on December 31, 1901, was as follows:

	December 31, 1900.	December 31, 1901.
Interest-bearing debt.....	\$1,001,499,770.00	\$ 943,279,210.00
Debt on which interest has ceased.....	2,654,070.26	1,339,790.26
Debt bearing no interest, United States notes, etc.....	385,144,806.41	388,612,563.88
Aggregate of interest and non-interest-bearing debt.....	\$1,389,298,646.67	\$1,333,231,564.14
Minus cash balance in the Treasury.....	290,107,336.81	321,003,278.63
Total net debt.....	\$1,099,191,310.86	\$1,011,628,285.51

Congressional Estimates and Appropriations.—The following table, condensed from that prepared by the clerks to the Senate and House committees on appropriations, shows (1) the estimates and total appropriations asked for for the fiscal year ending June 30, 1902; (2) the amount on these estimates agreed to by the House; (3) the amount agreed to by the Senate; (4) the amount which was actually granted by the House and Senate, and the date on which those grants became law; (5) the amount of appropriations passed by the first session of the 56th Congress the year previous, to apply on the fiscal year ending June 30, 1901:

TITLE	SECOND SESSION OF THE 56TH CONGRESS.				FIRST SESSION.	
	Estimates. 1902.	Amount agreed to by the House.	Amount agreed to by the Senate.	APPROPRIATIONS FOR FISCAL YEAR 1901-02.		APPROPRIATIONS FISCAL YEAR 1900-01. Amount.
				Date.	Amount.	
Agriculture.....	\$ 4,669,050.00	\$ 4,335,100.00	\$ 4,623,400.00	Mar. 2	\$ 4,582,420.00	\$ 4,023,500.00
Army	118,019,044.21	117,847,749.10	115,735,649.10	Mar. 2	115,734,089.10	114,230,095.55
Diplomatic and consular	1,897,638.76	1,808,808.76	1,860,028.76	Mar. 2	1,849,428.76	1,771,168.76
District of Columbia.	9,080,703.94	7,741,884.94	8,869,049.94	Mar. 1	8,502,269.94	7,577,369.31
Fortification.....	12,461,198.00	7,227,461.00	7,569,011.00	Mar. 1	7,804,011.00	7,363,618.00
Indian	9,250,571.09	9,052,836.09	9,966,777.20	Mar. 2	9,747,471.09	8,197,969.24
Legislative, etc.....	25,399,509.43	24,504,548.27	24,506,107.80	Mar. 2	24,504,968.85	24,175,652.53
Military Academy.....	1,045,750.18	699,163.68	772,653.68	Mar. 2	772,653.68	674,306.67
Navy	87,172,430.76	77,008,635.60	78,738,973.75	Mar. 2	78,101,791.00	65,140,916.67
Pension	145,245,230.00	145,245,230.00	145,245,230.00	Feb. 12	145,245,230.00	145,245,230.00
Post-office	121,267,349.00	123,782,688.75	123,802,888.75	Mar. 2	123,782,688.75	113,658,286.75
(a) River and harbor.....	25,130,000.00	22,802,711.30	22,278,830.00	(a)		560,000.00
Sundry civil.....	63,878,113.87	59,606,808.21	69,261,160.91	Mar. 2	61,795,808.21	55,419,915.45
Total.....	\$619,016,564.24	\$601,659,505.70	\$613,289,230.69			
Urgent deficiency, Indian affairs, National Home, etc.....	17,000,000.00	183,500.00	193,500.00	Jan.		
Deficiency, 1901, and prior years.....		12,580,437.79	15,566,308.73	Mar		
Total.....	\$636,016,564.24	\$614,373,443.49	\$629,129,039.62			
Miscellaneous.....	15,000,000.00					
Total, regular annual appropriations.....	\$651,016,564.24					
Permanent annual ap- propriations.....	124,368,230.00					
Grand total, regular and permanent an- nual appropriations	\$775,373,804.24					

(a) River and Harbor Bill failed to pass for 1902; but the sum of \$7,046,638 is appropriated in the sundry civil act to carry out contracts.

Amount of estimated revenues for fiscal year 1902.....\$600,000,000.00
Amount of estimated postal revenue for fiscal year 1902..... 116,633,042.00

Total estimated revenues for fiscal year 1902..... \$716,633,042.00
Total appropriations of first session of 56th Congress, for fiscal year
ending June 30, 1901..... 710,150,862.88
Total appropriations of second session of 56th Congress, for fiscal
year ending June 30, 1902..... 730,338,575.99

Total appropriations of 56th Congress..... \$1,440,489,438.87

Refunding Operations.—The total amount of consols of 1930 issued in exchange of bonds of 1908-18, 1907, and 1904 in accordance with the provisions of the congressional act of March 14, 1900, amounted, during 1901, to \$138,815,400. The total amount issued since March 17, 1900, was \$445,940,750, consisting of the following classes of bonds:

	Rate of interest.	Coupon.	Registered.	Total.
Loan of 1906-18.....	3	\$24,108,400	\$ 74,776,300	\$ 98,879,700
Funded loan of 1907.....	4	10,392,550	264,697,300	274,989,750
Loan of 1904.....	5	15,712,850	58,368,450	72,071,300
Total.....		\$50,108,800	\$396,831,950	\$445,940,750

Changes in the Public Debt.—The following table compiled from figures presented by the secretary of the treasury, shows the changes in the public debt of the United States during the fiscal year ending June 30, 1901:

	Rate of interest.	Outstanding June 30, 1900.	Issued during 1901.	Retired during 1901.	Outstanding June, 1901.
Interest bearing debt:					
Funded loan of 1891.....	2	\$ 9,853,250	.....	\$ 9,853,250	.....
Funded loan of 1907.....	4	355,528,350	3,700	98,156,000	257,376,050
Refunding certificates.....	4	35,470	.....	2,150	33,320
Loan of 1904.....	5	47,651,200	.....	25,797,100	21,854,100
Loan of 1925.....	4	162,315,400	.....	.....	162,315,400
Loan of 1908-18.....	3	128,843,240	.....	29,221,820	99,621,420
Consols of 1890.....	2	307,125,350	138,815,400	.....	445,940,750
Total.....	...	\$1,011,352,260	\$138,819,100	\$163,030,320	\$987,141,040
Debt on which interest has ceased.....	...	13,302,920	.....	11,887,300	1,415,620
Debt bearing no interest.....	...	388,761,732	104,562,868	110,309,016	383,015,584
Certificates and treasury notes.....	...	723,544,179	315,422,000	267,211,490	771,754,689
Bonds issued to Pacific railways.....	...	21,000	8,000	.....	13,000
Grand total.....	...	\$2,136,982,091	\$558,803,968	\$552,446,126	\$2,143,339,933
Grand total.....1900	...	1,992,006,306	820,058,410	675,082,625	2,136,982,091

Currency.—Discussions of currency and banking questions will be found in the article BANKS—BANKING. For the production of gold and silver in the United States see the articles GOLD and SILVER. The imports of gold for the calendar year 1900 amounted to \$56,749,084 and the exports to \$54,134,623, giving an excess of

DENOMINATIONS.	COINAGE FOR 1900.		COINAGE FOR 1901.	
	Pieces.	Value.	Pieces.	Value.
Gold:				
Double eagles.....	4,334,084	\$86,681,680.00	1,707,526	\$34,150,520.00
Eagles.....	874,960	8,749,600.00	4,603,616	46,036,160.00
Half eagles.....	1,734,730	8,673,650.00	4,264,040	21,320,200.00
Quarter eagles.....	67,205	168,012.50	91,323	228,307.50
Total gold.....	6,510,979	\$99,272,942.50	10,666,505	\$101,735,187.50
Silver:				
Standard dollar.....	24,960,912	\$24,960,912.00	22,566,813	\$22,566,813.00
Subsidiary:				
Half dollars.....	10,067,234	5,033,617.00	6,239,867	\$3,119,928.50
Quarter dollars.....	15,291,497	3,822,874.25	10,577,477	2,644,369.25
Dimes.....	24,779,182	2,477,918.20	25,073,500	2,507,350.00
Total subsidiary.....	50,137,913	11,334,409.45	41,890,834	\$8,271,647.75
Total silver.....	25,098,825	\$36,295,321.45	64,457,647	\$30,838,460.75
Five cent nickels.....	27,255,995	\$1,362,799.75	26,480,213	\$1,324,010.65
One cent bronze.....	66,833,764	668,337.64	79,611,143	796,111.43
Total minor.....	94,089,759	\$2,031,137.79	106,091,356	\$2,120,122.08
Total coinage.....	175,699,563	\$137,699,401.34	181,215,508	\$134,693,770.33

	General stock of money in the United States.	In Treasury.*	Money in circulation.
Gold coin (including bullion in treasury)....	\$1,176,172,153	\$262,800,534	\$ 635,374,550
Gold certificates*.....	.....	.....	277,997,069
Standard silver dollars.....	530,732,617	7,999,739	73,239,966
Silver certificates†.....	.....	.....	449,492,892
Subsidiary silver.....	91,975,381	6,914,287	85,061,094
Treasury notes of 1890.....	38,596,000	156,253	38,439,737
United States notes.....	346,681,016	5,614,630	341,166,386
Currency certificates, act of June 8, 1872†.....	.....	.....	.....
National bank notes.....	360,269,726	10,433,450	349,836,276
Total.....	\$2,544,446,893	\$293,818,903	\$2,250,627,990

* Not including \$106,390,363 deposited in national bank depositories to the credit of the Treasurer.

† All these certificates are covered by a corresponding amount of money held in the treasury and not included in the assets of the government.

imports of \$12,614,461. For the calendar year 1901 gold imports amounted to \$54,761,880 and the exports to \$57,729,889, giving an excess of exports amounting to \$2,968,009. The imports of silver for the calendar year 1900 were \$48,100,343 and the exports \$66,221,664, giving an excess of exports amounting to \$26,121,321. For the calendar year 1901 silver imports amounted to \$31,146,782 and the exports to \$55,638,901, giving an excess of exports to the amount of \$24,492,119. The table on the preceding page, prepared from figures furnished by the director of the mint, shows in detail the coinage of the United States for the year ending December 31, 1901, and shows also by classes the coinage of the previous year, so that comparisons may be made. The total coinage of each year is also given.

Banks.—See articles BANKS-BANKING; NATIONAL BANKS; STATE BANKS; PRIVATE BANKS; TRUST AND LOAN COMPANIES; SAVINGS BANKS.

Congress.—The second or short session of the 56th Congress met on December 3, 1900, and adjourned on March 4, 1901. President McKinley's message dealt at length with the policy of the government in regard to the Boxer uprisings in China and devoted much space also to the policy of the administration in the Philippines. The President insisted, as he had previously done on suitable occasions, that the United States had only entered upon the process of subjugating and civilizing the Filipinos from motives of beneficence, and in accordance with high international obligations. The Filipinos, he said, were the wards of the nation, and the task of governing them and fitting them for self-government had only been begun from humanitarian motives, and from the same motives, also, must be continued. The President renewed the recommendation made in his previous message that upon the federal judiciary be conferred the power of adjudicating such cases involving international relations, as had been occasioned by the lynching of five Italians at Tallulah, La. He commended to the early attention of the Senate the treaty signed by Lord Pauncefoot on behalf of Great Britain and by John Hay, secretary of state, for the United States, for the construction of a canal across the Isthmus of Panama. (See NICARAGUA CANAL.) He also recommended that Congress enact laws amendatory to the law of 1900, to safeguard still further the parity of gold and silver, and to make the currency more flexible. (See BANKING.) The reciprocity treaties with foreign countries pending in the Senate were recommended for ratification. "The policy of reciprocity," the President said, "so manifestly rests upon the principles of international equity and has been so repeatedly approved by the people of the United States that there ought to be no hesitation in either branch of the Congress in giving to it full effect." Congress, however, did not assent to the ratification of the pending treaties. The President renewed his previous recommendation that measures be taken by Congress to increase the proportion of American exports and imports carried in American vessels. During the last three years, he said, American vessels had carried only about 9 per cent. of the cargoes sent from or received in the United States, leaving 91 per cent. to be carried by foreign vessels. The growth of steel industries in the United States, the President considered, and the progress of ship-building for the lake and coastwise trade, as well as the steadily maintained expenditures of the government for naval purposes, had created an opportunity for placing the United States in the first rank of commercial maritime powers. (See paragraph Ship Subsidy Bill.) With regard to trusts, the President reiterated his statement of the previous year, that means should be taken to establish a complete system of laws, uniform throughout the United States, and adequate to remedy such evils as might be found in combinations of capital organized in trusts. (See TRUSTS.) Other important recommendations of the President were for the reduction of the internal revenue tax to the extent of \$30,000,000; to lay a government cable across the Pacific Ocean to Honolulu and Manila; to place the public lands of Porto Rico under the supervision of the Department of the Interior; to authorize a special medal of honor for soldiers and sailors on duty in the Philippines; and, as both he and every member of the cabinet had previously recommended, to authorize the construction of a hall of records in Washington for the preservation of the public documents. With regard to the much-discussed question of reapportionment, and as to whether the proportion of representatives allotted to the southern States should be cut down in view of their disfranchisement of negroes, the President confined himself to the recommendation that "Congress at its present session apportion representation among the several States as provided by the constitution." While the constitution, if its directions were literally obeyed, would greatly diminish the number of southern representatives, it is probable that the President neither expected nor desired Congress to take such action. The President recommended that the army be increased to a permanent force of 60,000, with authority to the President to increase, temporarily, the number to 100,000. He estimated that there would be needed in the Philippines in the immediate future from 45,000 to 60,000 men, and that, allowing for other purposes, the number he asked was absolutely necessary, especially for the coast defenses. More than \$60,000,000, he said, had been

expended since 1888 in a great number of coast forts and guns, with all the complicated and scientific machinery and electric appliances necessary for their use. The number of men required to keep these guns in order and to adequately handle them was estimated at not less than 18,420. The recommendations made by the secretary of the navy for new vessels and for additional officers and men were approved by the President. See paragraphs Army and Navy.

Although the short session of Congress passed few important bills in proportion to the large number passed by the first session, several laws of moment were enacted, among which may be mentioned the following: A bill for the reapportionment of representatives to Congress; an army reorganization bill; an army canteen bill; a bill prescribing under what conditions the United States would assent to withdraw its troops from Cuba (see CUBA, paragraph Relations to the United States); a bill vesting the President and his appointees with plenary power in the Philippines except in the matter of granting franchises; a bill for the reduction by some \$40,000,000 of the internal revenue taxes; a bill for establishing a national standardizing bureau; and a bill appropriating \$5,000,000 for the Louisiana Purchase Exposition (*q.v.*) at St. Louis. Most of these bills are discussed in subsequent paragraphs. Among bills which failed of passage were the Ship Subsidy Bill, an anti-trust bill, and a river and harbor bill calling for some \$50,000,000 in appropriations. The River and Harbor Bill for internal improvements had been finally agreed upon after conferences between the House and Senate, and it was brought up for final passage in the Senate on March 3, 1901, having already passed the House. On the afternoon of that day, Senator Carter, of Montana, who was to retire from public life the next day, took the floor with the avowed purpose of "talking the bill to death"; and under the rules of the Senate, allowing unlimited debate, Senator Carter, aided by friendly interpolations and questions of some two or three hours in length offered by senators friendly to his cause, did hold the floor until the Senate adjourned on March 4. The defeat of the bill by these means aroused much comment as to whether or not some form of closure should be adopted in the Senate, as was in force in the House. In general, public opinion seemed to negative this proposition on the ground that in the House practically no debate at all may be allowed on the most important bills; in the matter of the Philippine bill of 1901, for example, only two hours were allowed. As for several years past, the dominance of the Senate in legislative measures was evident throughout the session. Many bills were passed by the House without debate, it being perfectly well understood that when these bills reached the Senate they would receive careful attention, and that in any event the Senate would not allow any bills to go through in which it did not fully concur. Throughout the session comparatively little attention was directed by the press of the country toward the House of Representatives, and attention was focused rather upon the Senate and upon the views of its more prominent individual members.

Cabinet.—There were only two changes in the cabinet during 1901, though it was understood at the end of the year that the resignation of Lyman J. Gage, secretary of the treasury, was also pending. The attorney-general, John W. Griggs, of New Jersey, resigned in April, after having conducted to a practically successful issue in the Supreme Court the case of the government in the matter of the legality of tariff duties imposed by Congress upon the products of the United States insular possessions. (See paragraph Constitutional Status of Porto Rico and the Philippines.) Mr. Griggs was succeeded on April 5 by Philander C. Knox, of Pennsylvania. On his accession to the Presidency on September 14, 1901 (see paragraph Assassination of President McKinley), Theodore Roosevelt sought and gained the consent of the members of his predecessor's cabinet to retain their respective offices, at least for the time being. This action was strongly approved by public opinion as saving the country from the injury to the public interests which would have resulted from the sudden installation of a new cabinet, unfamiliar with pending questions and with the intricate machinery of the several departments. On December 17, Charles Emory Smith, of Pennsylvania, postmaster-general, resigned, and Henry C. Payne, of Wisconsin, was appointed in his place. The members of the cabinet at the close of the year were as follows: Secretary of state, John Hay, of Ohio, appointed 1898; secretary of the treasury, Lyman J. Gage, of Illinois, appointed 1897; secretary of war, Elihu Root, of New York, appointed 1899; attorney-general, Philander C. Knox, of Pennsylvania, appointed 1901; postmaster-general, Henry C. Payne, of Wisconsin, appointed 1901; secretary of the navy, John D. Long, of Massachusetts, appointed 1897; secretary of the interior, Ethan Allen Hitchcock, of Missouri, appointed 1898; secretary of agriculture, James Wilson, of Iowa, appointed 1897.

Inauguration of President McKinley.—In accordance with the results of the election in November, 1900, William McKinley was for the second time inaugurated President of the United States on March 4, 1901, and Theodore Roosevelt was inaugurated Vice-President. In his inaugural address, President McKinley noted the great industrial and financial prosperity that had come to the country since his

previous inauguration in 1897, and advised the concluding of broader commercial treaties with foreign nations in order to increase the foreign trade of the United States and to insure the permanence of commercial prosperity. With relation to Cuba, he asserted that the United States was pledged to see to it that the term "free Cuba" should be a reality, not a name—"a perfect entity, not a hasty experiment bearing within itself the elements of failure." The defense of the policy of the administration in the Philippines may be the best indicated in the President's own words: "There are some national questions in the solution of which patriotism should exclude partisanship." "They are obstructionists who despair and who would destroy confidence in the ability of our people to solve wisely and for civilization the mighty problems resting upon them." "Our institutions will not deteriorate by extension, and our sense of justice will not abate under tropic suns in distant seas." "Surely, after 125 years of achievement, we will not now surrender our equality with other powers on matters fundamental and essential to nationality." "Our countrymen should not be deceived. We are not waging war against the inhabitants of the Philippine Islands. A portion of them are making war against the United States." "The settled purpose, long ago proclaimed, to afford the inhabitants of the islands self-government as fast as they were ready for it, will be pursued with earnestness and fidelity." Vice-President Roosevelt, in his inaugural speech as president of the Senate, commented upon the greatness of the American nation and on the weighty problems that confronted it. "As keen-eyed," he said, "we gaze into the coming years, duties new and old rise thick and fast to confront us from within and from without. There is every reason why we should face those duties with a sober appreciation alike of their importance and of their difficulty. But there is also every reason for facing them with high resolution and eager and confident faith in our capacity to do them aright." Upon President McKinley's death (see MCKINLEY, WILLIAM), at Buffalo, on September 14, 1901, Theodore Roosevelt took the oath as President of the United States.

Foreign Relations.—The foreign relations of the United States during 1901 marked in a general way a continuance of policies previously laid down by the administration. With regard to China, the year saw the completion of the negotiations fixing the amount of the indemnity to be paid to the Powers for damages caused by the Boxer outbreaks of 1900. In these negotiations the United States acted virtually in conjunction with Japan and Great Britain on the more important questions involved. Several of the Powers, having small commercial relations with China, favored the imposition of a large indemnity, and the raising of the Chinese customs duties in order to insure the indemnity's payment. The United States, however, took the point of view that the indemnity should be within the reasonable means of China to pay, and that the material raising of the customs duties would mainly serve to diminish imports and so injure the powers having the largest commercial relations with China. On September 7 the settlement protocol was signed by the powers fixing the Chinese indemnity at 450,000,000 taels, and arranging also that the customs duties should not be raised beyond an effective 5 per cent. ad valorem. During the negotiations it had been proposed that the indemnity bonds issued by China should be guaranteed jointly by the powers. But Great Britain and the United States objected to this on the ground that it would discriminate against the more financially stable powers, by making them virtually the guarantors of the bonds, and the proposal was dropped. A proposal of the United States to have the final details of the indemnity arranged by The Hague International Court of Arbitration was vetoed by the other powers. In September, 1899, the United States secretary of state had invited the other powers to subscribe to an agreement that commercial advantages in China should be open equally to all the powers; that is to say, that all the powers should subscribe to the so-called "open door." The powers readily assented to this proposal, at least nominally, and this recorded agreement gave the United States a certain strategic advantage over Russia early in 1901, when it was understood Russia was endeavoring to make an agreement with China by which Russia should be allowed to hold Manchuria permanently as a dependency. On February 19 the State Department handed to the Chinese minister a memorandum to be transmitted to the powers, stating that as all the powers had agreed to the "open door" in China, and had agreed further to preserve China's territorial integrity in the existing crisis, it would be "unwise and dangerous in the extreme for China to make any arrangement or to consider any proposition of a private nature involving the surrender of territory or financial obligations by convention with any particular power, at least without the full knowledge and approval of all the powers." In dispatching this memorandum, the United States acted in effect in conjunction with Great Britain, which, as shown by its diplomatic correspondence, published in the summer, had been strongly objecting to the conclusion of a private convention between Russia and China. Perhaps, as a result of the combined stand of the United States and Great Britain, no convention between Russia and China had been completed by the end of 1901. The astuteness,

as also the benevolence of the American government, in the Chinese matter, was much praised in the United States during the year. It was also claimed that the United States had had a large, if not a predominating, influence, in so settling the Chinese trouble as to insure by the guarantee of the "open door" full commercial opportunities for American citizens in the Orient. On the other hand, it was objected to this view that what might be termed the public diplomacy of the United States, gaining the adherence of all the powers to a general proposition, would have practically very little weight in any crucial instance; that the actual diplomatic weight of each power in China was determined by its own willingness and ability to fight to gain its point, and that it was the general impression in European chancelleries that the United States would not, except under extreme and obvious provocation, fight to gain for her citizens the practical advantages of the nominal Chinese "open door." In this connection it was pointed out that in any event the open trade door could only mean freedom of trade to the United States in the sense of freedom from external and discriminating restraints, and would not and could not guarantee equality of opportunity in gaining trade. Russia, Great Britain, Germany, and France had actual and mutually exclusive spheres of influence in China which gained for them exclusive opportunity of gaining trade in those spheres. And the United States, if it did not also acquire a sphere of influence there, would hardly profit largely by a diplomatic "open door." See CHINESE EMPIRE.

The main diplomatic relations carried on with Great Britain during the year were with regard to a redrafting of the Nicaragua Canal convention. (See NICARAGUA CANAL.) While the course of these negotiations was not made public, it was generally understood that Great Britain was willing to concede every point which she could legitimately in order to maintain the especially cordial relations with the United States which had prevailed since the disposition of the Venezuelan boundary question. It might be said, perhaps without exaggeration, that the most important diplomatic relations with Great Britain during 1901 were those that were informal and semi-official. At the time of Queen Victoria's death, in January the United States flag was half-masted on the public buildings at Washington as a special tribute to her memory, in violation of all previous traditions. Similarly, on President McKinley's death in September, eulogies on his life and character and messages of sympathy from the royal family were given, and were doubtless intended to be given, much prominence in the press. The New York Chamber of Commerce, the most influential body in the United States, representing large financial interests, was invited to Great Britain in the summer, and its representatives were accorded a semi-official reception of pronounced cordiality. The continental press ascribed the development of this *rapprochement* between the United States and Great Britain as very largely due to the fact that Great Britain had found herself without a European friend in the Boer War, while various alliances between the continental powers made the friendliness of the United States especially valuable to Great Britain.

Minor foreign relations during 1901 were as follows: The claims of the United States against Turkey (*q.v.*) for damages sustained by American missionaries in Armenia were finally paid. Early in September Ellen M. Stone, an American missionary, was captured in Macedonia by brigands and carried over the border into Bulgaria. Considerable interest was caused by the event in the United States, but both Turkey and Bulgaria disclaimed responsibility for the kidnapping. Various diplomatic negotiations of interest were carried on with Venezuela and Colombia (*q.v.*). Early in the year a difficulty arose in Venezuela as to the rights of two asphalt companies to claim possession under Venezuelan franchises to the same territory. The difficulty led, as was stated, to an exchange of places between Francis B. Loomis, minister to Venezuela, and Henry W. Bowen, minister to Persia. Later in the year practical, but by no means official, war began between Venezuela and Colombia. The Colombian insurrectionists were assisted, as was stated, by President Castro, of Venezuela. Upon the attempted seizure by the Colombian rebels of the Panama Railway, Secretary Hay, on August 24, sent a memorandum to the governments at Carácas and Bogotá, tendering the good offices of the United States, and reminding them that by the treaty of 1846 between the United States and New Grenada, now Colombia, the United States guarantees freedom of transit across the Isthmus, and guarantees also to Colombia sovereignty on the Isthmus. In August, also, the battle-ship *Iowa* and the gunboat *Machias* were sent to the Isthmus and troops were landed to protect the route. On January 23, 1901, an extradition treaty was concluded with Peru and amendments were ratified by the Senate to the existing conventions with Great Britain and Chile. On January 22 the Senate ratified the treaty with Spain buying for \$100,000 the islands of Cagayan and Cibitu and other small ones lying outside the limits described by the Treaty of Paris. An extradition treaty was concluded in July with Roumania.

There was much interest during the year as to the commercial relations of the United States with European powers, and more especially as to the alleged hostility

of Germany and Austria-Hungary to the continued importation into those countries of great quantities of American products. Proposals were made by the Austro-Hungarian press for a combined continental tariff union against the United States, and this proposal was echoed more or less faintly by other European powers. The proposals were not taken very seriously in the United States, owing to the belief that the internal differences of the principal powers concerned would be too great to allow combined action against the United States; but at the same time the hostility to the American tariff schedules shown by the proposal strengthened the argument of those desiring a lower tariff scale. This feeling was accentuated when on July 26 a preliminary draft was published of a proposed new tariff law for Germany. (See GERMANY, paragraphs Industries and The Proposed Tariff; and AUSTRIA-HUNGARY, paragraph Commerce.) The tariff question was also given point by the action of the Treasury Department in imposing countervailing duties upon imports of sugar from Italy, Argentina, and more especially from Russia. The Russian countervailing duties are discussed in the following paragraph.

Countervailing Duties on Russian Sugar.—The discussion of the necessity of concluding reciprocity treaties (see paragraph Commerce) with other countries in order that those countries might not take retaliatory measures to offset the American tariff, received point from the result of the action of the secretary of the treasury, who announced on February 13, 1901, that, subject to an adverse decision of the courts, he would collect countervailing duties on Russian sugar imported to the United States. This action, the secretary said, was taken in accordance with the Dingley tariff law of 1897, which directed that when any country paid direct or indirect bounties upon export goods, then a customs duty equal to that bounty should be levied upon those goods when imported to the United States. Under this order, countervailing duties were already collected on sugars from France, Germany, Belgium, and the Netherlands, and those countries would consider themselves discriminated against if Russia did not receive the same treatment. Russia protested, however, that she did not pay a bounty on export sugar, and on February 15 M. de Witte, the Russian minister of finance, retaliated against the action of the secretary by increasing by 30 per cent. the import duties on American steel and iron products, exclusive of agricultural implements. Although statements prepared by the Treasury Department showed that the total exports of the United States to Russia in 1900 amounted to \$10,470,449, of which only \$2,872,429 would have been affected by this tariff retaliation, the exporters of steel and iron manufactures in this country were much alarmed, both because they did not wish their business in Russia injured, and more strongly because Russia's action might indicate a general policy in Europe to exclude American goods when possible. The case, therefore, was at once brought before the board of classification of United States general appraisers. But this board decided, on April 19, that the action of the secretary had been correct in law. The board stated that the Russian government, which practically supervises the sugar production of the country, taxes sugar sold at home, but remits that tax, through official certificates of export, on sugar sold abroad. If a bounty were to be defined as a benefit conferred upon a class of citizens at the expense of the treasury, then both the fact and the method of the release of Russian export sugar from taxation proved the existence of a bounty. Appeal from this decision was then taken to the Federal courts, and it was stated by opponents of the decision that if it were upheld, either the Dingley tariff would have to be modified or else European countries would be likely to discriminate against American spirits, tobacco, and iron and steel products, on the ground that they also were bounty-fed. For these goods, when exported, received from the United States a remission of the entire revenue tax, on drawbacks representing payment to the United States on the importation of articles used in their manufacture. In October, 1901, the United States circuit court rendered a decision upholding the opinion of the board of general appraisers, but granting an appeal to the United States Supreme Court, where the case was pending at the end of the year. For the commercial discussion of the sugar question see CUBA and SUGAR INDUSTRY.

Chinese Exclusion.—As the Geary Chinese exclusion law of 1882, reenacted with amendments in 1892 for a period of ten years, would expire by limitation in 1902, there was considerable discussion during the year 1901 as to the advisability of reenacting the law, with more stringent amendments. The law had been originally passed largely on account of the great number of Chinese coolie immigrants who had been brought into the United States by way of San Francisco to work on the Union Pacific Railroad. There were in 1882 about 77,000 Chinese in the country, mostly located in the West, and the cry then arose that American labor was being replaced by the cheaper Chinese labor. Although in 1902, owing to the exclusion laws, the number of Chinese in the country was but little more than half that of 1882, yet the Pacific States still claimed that the exclusion law should be reenacted and should be reenacted with more stringent provisions, because many Chinese still

came into the country by way of Mexico and Canada (see article IMMIGRATION), through evasions of the law. These advocates of Chinese exclusion asserted that there was an inherent and inevitable antagonism between Eastern and Western civilization, and that the preservation of American institutions, and, more especially, the maintenance of high rates of compensation for labor, necessitated the absolute elimination of the Chinese. On the other hand, it was alleged that, while it was quite true that the Chinese in America had always remained a people peculiar to themselves, not amalgamating or in any way affiliating with the other elements of population, yet this solitary bearing of the Chinese resulted not so much from their own characteristics as from the manner in which they were treated in this country. It was said that for certain classes of labor no other people were so good as the Chinese; that as a matter of fact, Americans would not perform the kind of labor the Chinese did, and that the Chinese would do it better and cheaper than the European immigrants. Moreover, American merchants wishing to increase their business with China pointed out that if the United States persisted in excluding the Chinese, while at the same time offering homes for all the peoples of Europe, China would inevitably close her markets to American goods. In the interests of foreign trade, as well as in the interests of the development of the Pacific coast, these persons claimed that the Chinese should be admitted to this country, at least to a limited extent. While at the end of the year there appeared no popular cry for the exclusion of the Chinese, such as had existed in 1882, yet by far the larger proportion of those who were interested in the question at all favored the exclusion of the Chinese, and it appeared, therefore, that the existing law would be reenacted.

Spanish Treaty Claims Commission.—By Article VII. of the Treaty of Paris the United States agreed to relinquish all claims for indemnity of its citizens against Spain "which may have arisen since the beginning of the late insurrection in Cuba and prior to the exchange of ratifications" of the peace treaty, and the United States further agreed of itself to "adjudicate and settle the claims of its citizens" relinquished against Spain. To give effect to this agreement, Congress passed a bill on March 2, 1901, providing for the appointment of "five suitable persons learned in the law, who should constitute a commission" to receive, examine, and adjudicate the claims which the United States had undertaken to settle. Besides these five commissioners, whose salary was to be \$5,000 each, there was to be appointed a clerk for each commissioner at \$1,200 a year; a general secretary at \$3,500 a year; an assistant attorney-general at \$5,000; two assistants to the assistant attorney-general at \$2,400 a year each, and a clerk to the assistant attorney-general at \$1,800 a year, or a total per year in salaries of \$46,100. The life of the commission was to be limited to two years, except that after the expiration of the two years Congress might extend the time indefinitely by renewal grants of six months each. The commissioners appointed by the President consisted of William E. Chandler, ex-senator from New Hampshire; Mr. Gerritt J. Diekema, of Michigan; Mr. James Perry Wood, of Ohio; Mr. William A. Maury, of the District of Columbia, and Mr. William L. Chambers, of Alabama. The commission was officially organized on April 8.

Revenue Reduction Act.—In his annual message submitted December 3, 1900, President McKinley stated that the income of the government for the year ending June 30, 1901, was estimated by the secretary of the treasury at \$580,000,000, and the expenditures at \$500,000,000, and therefore, although the government should be allowed enough surplus to meet all emergencies, a reduction to the amount of at least \$30,000,000 was asked in the war taxes. These taxes were laid by an act of Congress approved June 13, 1898, in order partially to defray the expenses of the Spanish war, and were estimated to raise \$100,000,000 annually, of which amount more than one-half came from beer and tobacco taxes. In accordance with the President's recommendation, a bill passed Congress on February 28, 1901, to take effects on July 1, reducing the war taxes by an amount estimated at \$41,000,000. The largest reductions made by the bill were on beer, about \$12,000,000; on tobacco, \$11,000,000; on bank checks, \$7,000,000; and on promissory notes, conveyances, etc., \$7,000,000. More specifically, the main provisions of the reduction bill were as follows: On tobacco, 20 per cent. discount on the original tax of twelve cents per pound; on cigars weighing more than three pounds per thousand, a tax of \$3 per thousand, as against the old tax of \$3.60, and on cigars weighing less than three pounds per thousand, a tax of 18 cents per pound, as against \$1; on cigarettes, a tax of 18 cents per pound as against \$1.50; on beer, 20 per cent. discount on the original tax of \$2 per barrel; on legacies, an amendment excluding from taxation legacies to charitable, religious, or educational institutions; the taxes on bankers' capital, certificates of stock transfers, and sales of products at exchanges are retained in their original or in a slightly modified form; the tax on foreign bills of exchange is fixed at the rate of 2 cents per \$100; steamship passage tickets are exempted below \$50 in value and conveyances below \$2,500; taxes on the following are repealed altogether: Commercial brokers, bank checks, certificates of deposit, promissory notes, money orders,

bills of lading for export, express receipts, telephone messages, miscellaneous bonds, certificates of damage and certificates not otherwise specified, telegraph messages, insurance, leases, manifests, mortgages, powers of attorney, protests, warehouse receipts, proprietary medicines, perfumery and cosmetics, and chewing gum.

Philippine Legislation.—On January 25, 1901, the President transmitted to the Senate a detailed report of the Philippine Commission, urging that Congress authorize the institution in the Philippines of complete civil government. "I earnestly recommend legislation," he said, "under which the government of the islands may have authority to assist in their peaceful industrial development." At the time that this recommendation was received, the Senate was engaged in discussing the subsidy bill (see paragraph Ship Subsidy Bill), and in putting the appropriation bills into shape for passage before March 4. The passage of the latter bills was imperative, and the Republican leaders had determined to insist upon the former also. It was known, on the other hand, that any act which drew up a definite permanent scheme of government for the Philippines—such, for example, as had been passed for Porto Rico in 1900—would meet with inter-party amendments and Democratic opposition that would probably necessitate a special session of Congress. Yet if no Philippine Bill at all were passed, a special session was equally likely. Under these circumstances it is timely to recall that the President, in pursuance of the purpose declared in his annual messages of December, 1898 and 1899, was already, and had been, in the absence of any "contrary expression of the will of Congress," exercising with signal ability absolute civil and military power in the Philippines. A specific redelegation to him of this authority would not only be momentarily convenient to Congress, but would allow the probable future drift of conditions in the Philippines to become manifest before Congress was forced to go on record by instituting a permanent governmental system. The so-called Spooner bill, therefore, giving the President full authority in the Philippines, was passed, together with the Platt amendment prescribing what relations Cuba should sustain to the United States (see CUBA, paragraph Relations to the United States), by the Senate on February 27 and by the House on March 1, as riders to the Army Appropriation Bill. Before the vote on the Spooner bill was taken, the following amendments, important in so far as they seemed to indicate the policy the government did not propose to follow, were offered and rejected: 1. The action of the United States in the Philippines shall be subject to the constitution and the laws, so far as applicable. 2. The United States does not intend to hold the Philippines permanently, but only to establish there a stable form of government. 3. The civil government established in the Philippines shall be participated in by the natives, so far as is consistent with its safety. 4. No official in the Philippines exercising legislative power shall also exercise judicial or executive power, or *vice versa*. The full text of the Spooner bill is as follows: "All military, civil, and judicial powers necessary to govern the Philippine Islands, acquired from Spain by the treaties concluded at Paris on the 10th day of December, 1898, and at Washington on the 7th day of November, 1900, shall, until otherwise provided by Congress, be vested in such manner as the President of the United States shall direct for the establishment of civil government and for maintaining and protecting the inhabitants of said islands in the free enjoyment of their liberty, property, and religion. Provided, that all franchises granted under the authority hereof shall contain a reservation of the right to alter, amend, or repeal the same.

"Until a permanent government shall have been established in said archipelago, full reports shall be made to Congress, on or before the first day of each regular session, of all legislative acts and proceedings of the temporary government instituted under the provisions hereof; and full reports of the acts and doings of said government, and as to the condition of the archipelago and of its people, shall be made to the President, including all information which may be useful to Congress in providing a more permanent government.

"Provided, that no sale or lease or other disposition of the public lands, or the timber thereon, or the mining rights therein, shall be made; and provided further, that no franchise shall be granted which is not approved by the President of the United States, and is not in his judgment clearly necessary for the immediate government of the islands and indispensable for the interests of the people thereof, and which cannot without great public mischief be postponed until the establishment of permanent civil government; and all such franchises shall terminate one year after the establishment of such permanent civil government."

The last clause of this bill, introduced at the instance of Senator Hoar for the purpose of safeguarding the archipelago's resources, was much criticised, on the ground that in so far as it was designed to prevent the granting of unwise franchises it was unnecessary, and that otherwise, especially by retarding the entrance of capital into the Philippines, serious harm would be done. The most important effect of the amendment, as shown by developments during the year, was the

curtailing of the available lumber supply of the Philippines, occasioning much inconvenience and a considerable amount of apparently needless suffering. See PHILIPPINES (paragraph Forests).

Reapportionment of Representatives.—By Article I. of the Constitution of the United States, Congressional representatives are required to be apportioned among the several States in proportion to the number of their inhabitants, as determined by each decennial census, but the total number of Congressional representatives is left to the discretion of Congress. The Congressional Reapportionment Bill brought forward by the census committee of the House as a result of the census of 1900 proposed to keep the membership of the House at its present number of 357, but to reapportion the membership by cutting down the representation from eight States, including Maine, whose population had not increased, at least materially, giving those representatives to other States whose population had increased. But for several reasons this bill was not satisfactory to the House. No State was desirous of having its representation cut down; Colorado, North Dakota, and Florida were left under the bill with one less representative apiece than they were entitled to; some of the northern States thought their representation to be insufficiently increased, and there was a general feeling, perhaps, that since it was the Republican States that had most largely increased in population, partisan advantage and abstract justice might profitably be hitched together by making full concession to the principle of popular representation. The Burleigh Reapportionment Bill was therefore substituted for the original one, and was passed by the House on January 8. This bill gave one representative for every 194,182 inhabitants, with the exception of Nebraska and Virginia, who were given one additional representative apiece for a somewhat less number. The total number of representatives was increased from 357 to 386, no State lost in representation, and 20 States gained. Of these States, Illinois, Texas, and New York gained 3 representatives each; Pennsylvania, New Jersey, and Minnesota, 2 each; and Florida, Louisiana, Massachusetts, Connecticut, Colorado, Mississippi, North Carolina, North Dakota, Washington, Missouri, West Virginia, Wisconsin, California, and Arkansas, 1 each. The representation in the House of each State under the new law is shown as follows:

Alabama.....	9	Illinois.....	25	Michigan.....	12	New York.....	37	Tennessee.....	10
Arkansas.....	7	Indiana.....	13	Minnesota.....	9	North Carolina.....	10	Texas.....	16
California.....	8	Iowa.....	11	Mississippi.....	8	North Dakota.....	2	Utah.....	1
Colorado.....	3	Kansas.....	8	Missouri.....	16	Ohio.....	21	Vermont.....	2
Connecticut.....	5	Kentucky.....	11	Montana.....	1	Oregon.....	2	Virginia.....	10
Delaware.....	1	Louisiana.....	7	Nebraska.....	6	Pennsylvania.....	32	Washington.....	3
Florida.....	3	Maine.....	4	Nevada.....	1	Rhode Island.....	2	West Virginia.....	5
Georgia.....	11	Maryland.....	6	New Hampshire.....	2	South Carolina.....	7	Wisconsin.....	11
Idaho.....	1	Massachusetts.....	14	New Jersey.....	10	South Dakota.....	2	Wyoming.....	1

Reapportionment of Presidential Electors.—In accordance with Article II., Section I. of the constitution, prescribing that the number of electors for President and Vice-President in each State should be equal to the total number of senators and representatives in that State, the electoral college was enlarged by the reapportionment law from 447 to 476 votes. Of the additional 29 electors, the Republicans, estimating from the election of 1900, gained 19 and the Democrats 10.

The Negro Question in the Reapportionment Bill.—In his annual message of December 2, 1900, President McKinley had recommended that Congress "apportion representation among the several States, as provided in the constitution." This instrument prescribed, under the fourteenth amendment, that when the right to vote in any State is denied to any male citizen over 21 years of age, "except for participation in rebellion or other crime," the basis of representation shall be reduced in the proportion which the number of such disfranchised male citizens bears to the total number of male citizens in such State. Although this provision had never been enforced since the troublous days of reconstruction, it had not till within the last few years been openly disregarded by southern States. Then Mississippi, Louisiana, and North and South Carolina amended their constitutions so as to exclude the bulk of the negro vote, and at the end of the year 1900 constitutional conventions for a similar purpose had been authorized in Virginia (see article VIRGINIA, paragraph Constitutional Convention) and Alabama (see article ALABAMA, paragraph Constitutional Convention). Under these circumstances, a resolution, intended to open up the whole question of negro suffrage, was introduced in Congress when the Reapportionment Bill came up for debate. The resolution recited that in the seven Congressional districts of Mississippi the total vote cast in 1890 was 62,652, and 27,045 in 1898; that in the seven Congressional districts of South Carolina the total vote in 1890 was 73,522, and 28,831 in 1898; and that in the six districts of Louisiana the vote was 74,542 in 1890, and 33,161 in 1898. Furthermore, certain southern members

in the House, representing a population of from 150,000 to 200,000 each, had been elected by a total vote respectively of about 2,000. In view of these facts, the resolution asked the census committee of the House to ascertain and report to what extent the suffrage was being denied to citizens in each State of the Union. This resolution the House rejected, many Republicans voting with the Democrats against it. The general feeling seemed to be that no good could come of reopening the great sectional question; that the South was solving in its own way its peculiar problem; that the bulk of the negroes were perhaps not fitted to exercise the suffrage; that the days of reconstruction had demonstrated the evils following the domination of State governments by the negroes; and that the southerners by opening negro schools and permitting educated negroes to vote had shown that they would accord the negro fair treatment. The point was also insisted upon that Massachusetts, Connecticut, Maine, and other States imposed an educational qualification upon the franchise, and that any reapportionment of representatives would therefore have to include these States.

St. Louis Exposition.—By an act passed March 3, Congress appropriated \$5,000,000, to be used in connection with the \$10,000,000 already raised by the Louisiana Purchase Exposition Company, to further the interests of the World's Fair to be held in St. Louis from May 1 to December 1, 1903, in commemoration of the centennial of the purchase of the Louisiana Territory from France in 1803. But as a condition precedent to the payment of the Federal appropriation, the directors of the fair were required to "contract to close the gates to visitors on Sundays during the whole duration of the fair." Nine Federal commissioners, to retain their office not later than January 1, 1905, and to receive an annual salary of \$5,000 each, were authorized to be appointed by the President, to supervise the government interests at the fair and to divide with the local directors of the fair its general management. Buildings for the government exhibits were authorized to be built at an expense not exceeding \$250,000. Articles sent from foreign countries for exhibit were directed to be admitted free of duty, provided that if such goods were sold while in this country to American citizens, the import duties should be rebated to the government. See LOUISIANA PURCHASE EXPOSITION.

National Bureau of Standards.—By an act approved March 3, Congress, in accordance with the requests of many university faculties, scientists, manufacturers, and agriculturists, reorganized and enlarged the scope of the Office of Standard Weights and Measures in the Treasury Department, and renamed it the National Bureau of Standards. The duties of the bureau were declared to be: "The custody of the standards; the comparison of the standards used in scientific investigation, engineering, manufacturing, commerce, and educational institutions with the standards adopted or recognized by the government; the construction, when necessary, of standards, their multiples, and subdivisions; the testing and calibration of standard measuring apparatus; the solution of problems which arise in connection with standards; the determination of physical constants, and the properties of materials, when such data are of great importance to scientific or manufacturing interests and are not to be obtained of sufficient accuracy elsewhere." In other words, a scientific bureau of last resort is established, for the lack of which previously there had been no absolute standard for instruments like barometers, thermometers, pressure gauges, and polariscopes; the sale of American instruments had been checked abroad, and there had been many financially serious disputes. Firms, individuals, scientific societies, etc., engaged in work requiring standard measuring instruments, were entitled, upon payment of a small fee, to request the services of the bureau, and the bureau was also directed to perform, free of charge, work for the United States or any State government. See PHYSICS.

Tariff Discussion.—The discussion as to the advisability of revising the tariff schedules—a discussion which had lain practically dormant for some five years—began again during the year 1901. One of the causes for this was probably the settlement of the silver question, which had diverted men's minds from all else. The more immediate occasion, however, was the formation of the United States Steel Corporation (*q.v.*), the coincident introduction of a bill into the 56th Congress to take duties off steel and iron, and later, in September, President McKinley's Buffalo speech advocating reciprocity treaties and the removal of tariffs where they were not really needed by domestic manufacturers. The arguments for lowering the tariff schedule were mainly that these tariffs had been originally enacted to protect the United States' "infant industries"; but that the infant industries, shielded behind the tariff law, had grown to be among the largest manufacturing concerns in the world, and were at present fully able to compete successfully in foreign markets, and to hold their own in the United States against foreign importations, even if all tariff protection were removed. This fact was attested by the export trade of the United States (see paragraph Commerce), which had nearly doubled within ten years. Furthermore, the signs were many that European nations were becoming

aggrieved to a not inconsiderable extent over the United States' tariff system, and the exclusion from the United States of foreign goods, which could not be successfully made, or even successfully imitated in the United States. If the American tariff was maintained, it was extremely likely that the European nations would retaliate, if not in concert, at least individually, in raising a similar tariff against American goods. While the increase of the American foreign market up to the present time might be attributed to a considerable extent to the American tariff system, yet the maintenance of that tariff might act to reduce foreign trade. In the second place, it was alleged that the tariff system was as much as any other single factor responsible for the rapid if not unprecedented development of trusts, approximating to monopolies, in the United States. For many of these trusts were directly protected by the tariff from foreign competition, and through this protection they were enabled to raise the price of commodities far above the manufacturing cost, plus a reasonable margin of profit. For example, from figures collected by Mr. Charles Beardsley in the *Quarterly Journal of Economics*, it appeared that the National Salt Company was protected by a duty of 89 per cent., the Starch Company by a duty of 73 per cent., the Carbon Company by a duty of 115 per cent., the Distilling Company by 103 per cent., the Tin Plate Company by 47 per cent., the Steel and Wire Company by 40.22 per cent., the Window Glass Company by 66 per cent., and the Table Glass Company by 60 per cent. It was argued that a radical reduction on the duties protecting such companies would be of advantage both to the consumer and to the manufacturer; to the advantage of the consumer because either the same wages could be paid to the workmen and the product sold at a cheaper price, or the product could be sold at the same price and the wages advanced; to the advantage of the manufacturer because he would have a decreased cost of production, thereby allowing him to compete more successfully in foreign markets. A third reason advanced for the reduction of tariffs, at least on the raw materials of manufacture, such as ore, iron, wool, hides, woods, dyestuffs, etc., and on the completed products of such industries as were already competing successfully with foreign products in their own markets, was that the present system acted to differentiate against the home consumer in favor of the foreign consumer. For under the protective tariff, profits were so large that many large concerns habitually sold dear in the home market and cheap in the foreign market. They sold dear in the home market because protection debarred competition, and cheap in the foreign market, where there was no protecting tariff. The removal of this tariff, therefore, would force the manufacturing companies to sell at practically the same rates both at home and abroad. In general, the manufacturers admitted the fact of their selling cheaper abroad than at home, but defended their action on the ground that on their total business they made only a fair per cent.; the business, they said, must be kept running unless enormous losses were to be suffered through depreciation attendant upon stopping the mills. In case, then of bad times at home or of surplus production, it paid them to sell to Europe at or below the cost of production, in order to retain their hold upon the home market, to maintain prices, and to keep their plants in running order.

In view of the enormous trade expansion of the United States within recent years, and especially since 1897, and more particularly in view of the enormous consolidated industrial enterprises which had been formed, and which obviously needed no protection for their goods, advocates of maintaining the tariff as it was, rested their arguments less upon general grounds than upon the difficulty of changing any particular item in the tariff without upsetting the whole structure. And from a tactical and political point of view, it was indeed almost obvious that there was no protected industry which would not object in the most vigorous manner to the withdrawal of protection from itself alone. There was no industry which might not claim with a fair show of justice that if tariffs were to be reduced at all they should be reduced pro rata all around. But if duties were to be reduced pro rata, inter-party feuds and jealousies would be sure to be aroused, of vehemence enough to seriously endanger the success of the Republican party for several years to come. As had been abundantly shown, there was probably no Congressional task more difficult than that of reapportioning tariff protection, and if the party in power was not absolutely forced to it, the reasons were abundant for letting the tariff alone. Furthermore, the protectionists urged that the end sought of removing unnecessary tariffs might soon be accomplished without friction by the formulation of reciprocity treaties with various countries. And although it was known that there were at present only four unimportant reciprocity treaties in force, and that the Senate had in 1901 refused to ratify any others, and that in any case reciprocity treaties were often of a kind which did not reciprocate, yet it was still confidently maintained that the tariff should not be lowered, but that reciprocity conventions should be signed. At the time of the convening of the 57th Congress in December, 1901, it seemed evident that the Republican leaders were practically agreed that the general revision of the tariff would be destructive of existing Republican harmony, and that it should therefore not be undertaken.

Tariff on Domestic Industries.—Besides the discussion as to the advisability of lowering the tariff law against foreign goods and as to the necessity of making concessions to Cuban sugar planters, there were brought to the attention of the country at least two proposals to tax one domestic industry in favor of another. The first of these was embodied in the so-called Grout Oleomargarine Bill (see article OLEOMARGARINE), and the second in a bill prepared by the National Live Stock Association. The Oleomargarine Bill, introduced in the 56th Congress, was prepared in the interests of farmers, and while purporting only to prevent fraud in the selling of oleomargarine for genuine butter, would, it was alleged by its opponents, seriously injure, if not entirely destroy, the oleomargarine industry. Moreover, it was stated, the principle that would be established with its passage would be that "the taxing power of the government might be used to drive out a competing industry wherever it could be shown that the cheaper product was sold under the guise of the better one." The second bill, formulated by the National Live Stock Association, provided in effect that the sale of garments not made wholly of new or unused sheep's wool should be prohibited, unless such garments were plainly marked by the manufacturer, wholesaler, and retailer so as to show what per cent. of the material of the garments was made from new wool and what per cent. was "shoddy." "Shoddy" garments are those in which cotton and wool from old worn-out clothes, are re-used in combination with new wool, the garments thus built up being sold as new, though at greatly reduced prices. Under the Dingley tariff, which imposed an almost prohibitive duty upon the importation of raw wool, this "shoddy" industry has largely increased, and persons having extensive live-stock interests claim that it is mainly on account of this industry that the consumption of wool in the United States has declined from 8.2 pounds per capita per annum, under the Wilson tariff, to 4.5 pounds under the Dingley tariff. If now, the argument is stated, shoddy garments are made by law to appear as such, they will no longer be bought to any considerable degree, since the pride of the poorer people, who are the chief consumers, is notorious, and it is only because the shoddy garments are palmed off as woollen that the industry thrives. That shoddy clothes are a fair bargain, price considered, is not denied; but it is held, and truly, that fraud is practiced in their sale, and this fraud the Pure-fibre Bill proposes to bring to a halt. In practice, however, as is admitted, the passage of the Pure-fibre Bill, by limiting artificially the utility of wool and the length of time during which it could be used, would tend to create an additional and artificial demand for new wool at the hands of the buyers. It was pointed out, moreover, that if this bill and the Oleomargarine Bill were passed, there was no reason why numerous other imitative industries, selling substitute articles "just as good" as the original, should not be required by law in like manner to proclaim themselves as imitations, and thus reduce their sales to the advantage of rival industries. Thus, for example, the manufacture of cottonseed oil, simulating olive oil, might be curtailed, or the thriving industry of Maine, where herring are translated into the "best sardines" on the market. In other words, the passing of the initial bills noted above, by using the taxing power of the government to decide controversies between rural domestic industries, might not only have far-reaching economic effects, but might prove the entering wedge to an unprecedented régime of frankness in the commercial world.

Ship Subsidy Bill.—Throughout 1901 discussion continued upon the question as to whether it was advisable to subsidize American ships, and more especially upon the advisability of the particular form of ship subsidy advocated by Senator Frye and incorporated in successive bills presented in Congress. The original Ship Subsidy Bill was offered in the Senate in December, 1899. But it proved undesirable, even if it had been possible, to force the bill through the Senate before the national election, and it was not therefore seriously pressed for passage until the reassembling of the second session of the 56th Congress in December, 1900. Very considerable efforts were then made to have the Senate act affirmatively upon it. But owing to continued opposition, the press of other business, and the fact that Congress adjourned on March 4, the bill went no further than to become the unfinished business of the Senate for a few days. When Congress reassembled in December, 1901, the Ship Subsidy Bill was again presented, but in a widely different form. Under the old bill subsidies were to be given to all American vessels engaged in the foreign trade, the amount of subsidies varying in accordance with the speed, tonnage, and cargo of the vessel. By the amended bill, these general subsidies were made practically uniform for all ships, and were greatly reduced in amount, the subsidy for vessels under 1,500 tons being fixed at 1 cent per gross registered ton for each 100 nautical miles sailed, and the subsidy for all vessels over 1,500 tons 1.25 cents per 100 nautical miles. Under the existing conditions of American shipping, and unless those conditions should be changed by some special act of Congress, as will be noted below, it was estimated that the total payments under this general subsidy scheme would aggregate not more than between \$600,000 and \$1,000,000 a year. But while

the amount of general subsidy was thus made insignificant in amount, an entirely distinct section of the bill, devoted to the subject of "postal subsidies" alone, vested the postmaster-general with sweeping power to make contracts with the owners of American-built vessels to carry the United States mails. The postmaster-general was authorized to enter contracts for terms of from 5 to 15 years, in his discretion, and to make payment at the rate of between 2.7 cents and 1.5 cents per 100 nautical miles sailed, depending upon the speed and tonnage of the steamer. Vessels of the first class, entitled to the highest rate of payment, were to be of 10,000 tons register, and to have a speed of 20 knots; vessels of the second class, entitled to the lowest rate, were to have a tonnage of 2,000 tons and a speed of 14 knots, and the intermediate grades of vessels were to be entitled to intermediate rates of payment for carrying the mails.

To this bill as a whole serious objections were advanced by such representative bodies as the Merchants' Association of New York. It was said, in the first place, that the object whose attainment had been insisted upon as constituting the justification for the original Ship Subsidy Bill of December, 1899, namely, the object of increasing the amount of United States exports and imports carried in American-built vessels, was curiously slighted in the final bill presented. For the final bill nowhere made reference or stipulation as to the amount or kind of cargo which subsidized vessels should carry, or whether such vessels should carry cargoes at all, and in any event, vessels under the general subsidy would not be benefited to a greater extent annually than \$1,000,000 as a maximum. That is to say, they would not be benefited to a greater amount than \$1,000,000, unless Congress should, after the passage of the Ship Subsidy Bill, pass a special act allowing the register as American vessels of foreign-built vessels. Now, it was thought by the opponents of the bill that this was precisely what its advocates intended. And a color of reason was lent to this assumption from the fact that while it was specifically stipulated under the section dealing with postal subsidies that vessels receiving postal subsidies should be American-built, under the section dealing with general subsidy it was only stipulated that the vessels should be of American register, thus giving opportunity for the passage of a special act allowing foreign-built vessels to register as American. Now, if foreign-built vessels were not allowed to thus register, obviously the whole general subsidy would fail in effect on account of the meagreness of the allowances. But if foreign-built vessels were allowed to register, no benefit would accrue to that most important branch of the shipping industry, namely, the building of ships in American yards. In this connection it was also noted that while the original Ship Subsidy Bill fixed \$9,000,000 as the limit which should be paid in all subsidies in any one year, the final bill made no restrictions whatsoever as to the total amount of money to be paid.

In commenting upon this phase of the bill, the Merchants' Association said in a letter to its author, Senator Frye, of Maine: "The widely reported recent acquisition of a very large fleet of foreign tonnage on American account gives rise to a general belief that it is contemplated to ask American registry for that tonnage, which in the terms of the bill as criticised would entitle it to a subsidy. You very clearly point out how this might be done by act of Congress, for which precedent could be cited, and it is in this, or in the payment of American subsidy to tonnage of foreign construction under any conditions whatever, that we find a radical objection to the bill, and it seems to us that the inconsistency which we have pointed out simply prepares the way for such a condition. . . . In the bill at present under consideration no limitation whatever is placed upon the extent of subsidy, and the enormous amount of American money that might be claimed by foreign tonnage acquiring American registry induces our urgency for the correction in the language of Title 2, Section 6, to put it beyond any doubt that only vessels of American construction are eligible to subsidy."

As to the other section of the bill, dealing with postal subsidies, it was noted that in view of the rapid and continuous progress in the art of ship-building it was unreasonable for the American people to make a contract with any vessel for 15 years, especially as the contract might be made to date ahead. By the end of 15 years the vessel contracted with might and probably would be junk so far as concerned its usefulness to the United States, whether for carrying the mails or for acting as an auxiliary cruiser in time of war; and yet under the bill the United States would be forced for the entire period to pay the vessel the highest rates of postal subsidy.

Military Operations in the Philippines.—Throughout the year 1901 the struggle in the Philippines continued to bear the character of guerrilla warfare which it had assumed early in 1900. No engagements occurred of sufficient importance to be ranked as battles, the fighting being entirely confined to very small bands of men on both sides. The position of the American troops, however, was rendered all the more difficult by the fact that they were obliged not only to act on the defensive against fugitive enemies carrying on no regular mode of hostilities, but to be on

their guard also against the treachery of natives nominally reconciled to American rule in towns and provinces officially pacified. The story of the fighting through the year is merely a record of sudden onsets by insurgent bands, and, on the part of the Americans, by a persistent, indefatigable sleuthing and chase over large extents of territory made difficult and often practically impassable by the lack of roads and adequate facilities for transport. Some conception of the nature of military operations in the Philippines may be obtained from the report of Major-General MacArthur for the year ending June 30, 1901. Between May 5, 1900, and June 30 of the succeeding year there had been no less than 1,026 contacts between the American troops and the insurgents. On the American side the casualties amounted to 245 killed, 490 wounded, 118 captured, and 20 missing, an average total general loss of 8 men for every engagement, and only 1 killed for every 5 engagements. The losses of the Filipinos were much more considerable, comprising 3,854 dead, 1,193 wounded, and 6,572 captured. The number of insurgents who submitted during the year was 23,095.

A further idea of the character of the struggle may be gathered from the history of a half-dozen days during the first six months of 1900, as reported by General MacArthur. On January 10 the record stands: One sergeant and 11 insurgents captured in the province of Silang, Luzon, no American casualties; 21 insurgents killed and 9 captured near Tarrangona, in the island of Leyte, with the loss of 1 killed; an insurgent arsenal destroyed at Patunga, Luzon. February 10, 925 natives swear allegiance at Santa Catalina, Luzon; 13 insurgents killed and 35 wounded at Bittin, Luzon, American casualties 4 wounded; 80 men of the 20th U. S. Infantry and 33d Volunteers defeat a force of insurgents near Candon, Luzon, with a loss of 7 killed, American casualties 1 wounded; Lieutenant Maluta, with 8 soldiers, 9 rifles, and 400 rounds of ammunition, surrenders in Panay. March 10: Two officers, with 39 men, surrender at Balayan, Luzon; 4 ladrones captured the *La Paz*, Luzon; 3 insurgents, 2 rifles, and 100 tons of rice captured at Binan, Luzon; a company of native scouts attack 40 insurgents near Santa Maria, in Luzon, capture 2 rifles, 1 revolver, 3 ponies, 400 rounds of ammunition, with no casualties on either side; 1,728 natives swear allegiance at Banta, Luzon; 236 at Santa, 1,461 at Narvacan, 1,700 at Lapo, and 3,360 at Batac, all in Luzon. April 10: Colonel Arce surrenders at Castillejos, Luzon, with 12 officers, 235 men, and arms. May 10: Demaguilla surrenders at Nagcarlang, Luzon, with 17 officers, 55 men, 43 rifles, and 1,400 rounds of ammunition. June 10: Forty-five Americans of 21st Infantry encounter 500 insurgents at Lipa, Luzon, American loss, 2 lieutenants, 1 corporal, one native scout killed, 3 men wounded, insurgent loss unknown; detachment of 26th Infantry engages insurgents near Jovellar, Luzon, kills 5, wounds 1, captures 2, takes 3 rifles and 25 rounds of ammunition. The record is descriptive of the war throughout 1901.

Occasionally, however, more serious reverses were inflicted upon the Americans, as occurred to Captain Connel, of the 9th Infantry, at Balangiga, on the island of Samar, on September 29. With a detachment of 72 men, Captain Connel had come to garrison the town, and had been received by the natives, who had all taken the oath of allegiance, with manifestations of great joy. Thrown off their guard, the Americans relaxed somewhat from the precautions of ordinary routine. On the morning of September 29, while the soldiers were breakfasting at some distance from where their arms were stacked, they were rushed by two bands of bolomen, numbering about 500 in all, headed by the "pacified" presidente of the town. Very few of the American soldiers succeeded in getting at their arms, and of the 72 men, 48 were cut down on the spot, including the captain in command and most of the officers. Only 24 men, seriously wounded, succeeded in effecting their escape. This case is typical, as the daily capture of a half a dozen rifles and a hundred rounds of ammunition is typical.

By the middle of 1901 the islands of Leyte and Panay had been pacified, but fighting still continued in the island of Samar, which became the centre of operations. On account of the rough character of its surface and the total absence of communication, the island became a rallying ground for fugitive insurgents from the other provinces. Active operations were carried on under General Hughes, down to the end of the year. Bohol and Cebu were also insurgent strongholds, and witnessed renewed activity on their part during the last months of the year. In Luzon itself there was great unrest, and there was considerable anxiety even at Manila. In the provinces of Tayabas, Batangas, and Bohol, where civil rule had been established, military law was once more proclaimed.

The Army.—On June 30, 1901, the American forces in the Philippines consisted of 1,064 officers and 46,678 men. In addition, the native scouts numbered 22 officers and 5,550 men; the native police, 32 officers and 1,250 men; and the metropolitan police, 606 men; giving a total effective force of 1,118 officers and 54,174 men. Between May 5, 1900, and June 10, 1901, the activity of the Americans had resulted in the capture or enforced submission of 1,741 insurgent officers and 21,354 men. In June,

1901, United States troops were garrisoned in 474 of the principal towns on the islands of Luzon, Panay, Cebu, Negros, Samar, Marinduque, Mindanao, Leyte, Corregidor, Bohol, Jolo, Masbate, Catanduanes, Romblon, and Siassi. Disease among the troops was less prevalent than in 1899-1900, the ratio of non-effectives sinking from 8.84 to 7.52 per cent., which was the average of the nine months ending March 31, 1901. The improvement was ascribed partly to greater care in sanitation, but in still greater degree to the fact that the regiments had been "gradually weeded of their weaklings and chronic invalids. Immature youths, hard drinkers, and recruits constitutionally unfit" had been sent back to the United States, and only seasoned soldiers, disciplined and moderate in their habits, had remained. Still there was a large amount of illness, due to the inevitable exhaustion induced by the tropical climate upon members of the Caucasian race.

The Capture of Aguinaldo.—From certain dispatches of Aguinaldo which fell into the hands of the American authorities early in February, it was learned that the leader of the Philippine insurgents was encamped in the neighborhood of Palanan, in central Luzon. With the consent of General MacArthur, Brigadier-General Funston entered upon the execution of a plan for the capture of the head of the Philippine republic. Accompanied by Captain Hazzard, Captain Newton, Lieutenant Hazzard, and Lieutenant Mitchell, together with four surrendered insurgent officers and some 80 Macabebe scouts, General Funston set out from Manila on March 3 on board the *Vicksburg*, landed in the province of Principe, and started on a 90-mile march into the interior. Letters were sent forward to Aguinaldo with the forged signature of General Lacuna to inform him of the approach of a Filipino force with four American prisoners. On March 23 Funston and his companions, pretended captives of the Macabebes, arrived at Palanan, and were being escorted to the house of Aguinaldo, when one of the pseudo Filipinos ordered the Macabebe scouts to fire. The Tagalogs were instantly routed without Aguinaldo's suspicions being aroused; for remaining in the house, he believed the firing to be only in honor of the new arrivals. He stepped to the window, ordering his men to quit wasting their ammunition, when he was seized by one of the officers who had come with Funston. Aguinaldo's companions were overpowered or escaped, and the rebel chief himself was taken to the coast and placed aboard the *Vicksburg*, bound for Manila, where he arrived on March 28. The effect of Aguinaldo's capture upon the military situation in the Philippines was considerable, though not as far-reaching as might have been expected. Upon being brought to Manila, Aguinaldo issued a proclamation acknowledging the defeat of the Filipino cause and calling upon all patriots to lay down their arms and to submit to American sovereignty for the welfare of their own country. This proclamation was followed by the surrender of considerable bodies of insurgents, the principal leaders who submitted being General Mascardo, who surrendered in May with some 350 men; General Cailles, who gave himself up in June with more than 650 men; and, most important of all, General Bellarmino, who surrendered on July 5 with more than 1,000 men. The irreconcilable faction among the insurgents, however, renounced all connection with Aguinaldo and continued operations under a new leader, appointed by the Junta at Hong Kong. In the United States General Funston's exploit aroused an immense amount of discussion, as to the justification of his act from the point of view of pure ethics and military etiquette. A noticeable change was produced, too, in the attitude of the opposition press with regard to the entire Philippine problem. It seemed to be admitted on all hands that with the capture and submission of Aguinaldo, the question of successful resistance on the part of the Filipinos, and, therefore, of ultimate independence for the islands, was ended. The critics of the administration shifted their point of attack from the abstract problem of the rights of man to the policy of pacification pursued by the President and the system of government which the administration seemed inclined to introduce. General Funston's daring act resulted, therefore, in changing the debate from Philippines or No Philippines to one of Colonies or Constitutional Territories.

Federal Judiciary.—The justices of the Supreme Court of the United States and the dates of their appointments are as follows: Melville Weston Fuller, of Illinois, chief justice, appointed 1888; John Marshall Harlan, of Kentucky, appointed 1877; Horace Gray, of Massachusetts, appointed 1881; David Josiah Brewer, of Kansas, appointed 1889; Henry Billings Brown, of Michigan, appointed 1890; George Shiras, Jr., of Pennsylvania, appointed 1892; Edward Douglass White, of Louisiana, appointed 1894; Rufus W. Peckham, of New York, appointed 1895; Joseph McKenna, of California, appointed 1897.

Constitutional Status of Porto Rico and the Philippines.—By decisions handed down on May 27, 1901, followed by supplementary decisions handed down on December 2, 1901, the Supreme Court of the United States determined in one important particular, carrying, however, numerous other and far-reaching deductions, the constitutional relations of the United States to acquired colonies and the scope of

the authority of Congress to legislate for such colonies. In their practical aspects—that is, in their immediate and in their probable future reaction upon the policies and politics of the United States, domestic and foreign—the decisions were asserted to be the most momentous that had been handed down since the Dred Scott decision; and for that reason the exact scope of the conclusions reached and the premises leading up to them were subjected to an exhaustive discussion by the popular press of the country, and to an exact analysis by law and technical journals.

Broadly speaking, the decisions involved the main question as to whether land gained by the United States by treaty or conquest became thereby a *part of* or only an *appurtenance to or possession of* the United States, and also the supplementary question as to what tariff legislation it was competent in either case for Congress to enact. In their conclusions, and therefore in their legal and binding effect, though by no means in their course of reasoning or in their internal structure, the majority opinions of the court determined upon these matters, (1) that colonies acquired by the United States became *de facto* and without further legislation a part of the United States; (2) that Congress could lay a tariff upon both exports and imports between the United States and those colonies. Of the twelve specific cases decided by the court, two contained the principles enunciated, and revealed also the differing separate judicial opinions, which, when collated, fixed the binding conclusions arrived at. In these cases the court was divided as to opinion into three sections, and the combination of the second judicial section with the first in the one case, and of the second judicial section with the third in the other case, determined the ruling. The two cases were those of *De Lima versus Bidwell* and of *Downes versus Bidwell*. That of *De Lima versus Bidwell* questioned the right of the government to collect duties under the Dingley tariff law of 1897 upon goods imported to the United States from Porto Rico after the ratification of the Treaty of Paris, February 6, 1899, and prior to July 1, 1900, when the Foraker act of Congress, instituting a civil government for Porto Rico, went into effect. The case of *Downes versus Bidwell* was as to the legality of the Foraker act, in so far as it levied a duty of 15 per cent. of the Dingley tariff upon goods imported from Porto Rico to the United States. In both cases the validity of the import duties hinged upon what territorial or other organic relation, if any, the court should determine Porto Rico bore to the United States. For by its own terms the Dingley tariff levied duties only upon articles "imported from foreign countries," and the Foraker tax clause would be illegal if it violated the constitutional mandate that "all duties, imposts, and excises shall be uniform throughout the United States." Therefore, the question at bar was whether Porto Rico was "foreign" or a "part of the United States," and in what sense.

Roughly and in merest outline, the opinion of the justices upon this question was as follows: Justices Fuller, Harlan, Brewer, and Peckham held that when a colony was (1) ceded to and (2) in possession of the United States, then it became automatically a territory and integral part of the United States, and therefore Congress could not raise a tariff wall against it. Justices White, Shiras, McKenna, and Gray held that if a colony was an integral part of the United States, then, as stated by Justices Fuller, Harlan, Brewer, and Peckham, a tariff between the two countries was unconstitutional; but Justices White, Shiras, McKenna, and Gray held that cession and possession alone did not incorporate a colony in the United States, but only made it an appurtenance to the United States, and therefore a tariff against such a colony could be enacted by Congress. Justice Brown, constituting, as it were, a third judicial section of the court, held, with Justices Fuller, Harlan, Brewer, and Peckham, that cession and possession did incorporate a colony in the United States; but he also held, against the combined weight of the court, that a tariff against such an incorporated colony could be laid by Congress; and by this course of reasoning, singular to himself, Justice Brown, in the *De Lima* case, nevertheless arrived at the same practical conclusion as Justices Fuller, Harlan, Brewer, and Peckham, thus turning the majority opinion of the court 5 to 4 against the government; and in the second case, through the same individual premises, he reached the same practical conclusions as Justices White, Shiras, McKenna, and Gray, thus again turning the majority opinion of the court, 5 to 4 in favor of the government. Generally speaking, the decision in both cases was determined by the answer to two questions presented in the following order: (1) Did Porto Rico become a *bona fide* Territory by the ratification of the Treaty of Paris? (2) Can import duties be laid against a *bona fide* Territory? To the first question five justices answered in the affirmative, and to the second eight answered in the negative. Thus there was a majority opinion against the government on both questions, and if the questions had been presented in reverse order, both decisions, as well as both questions, would have been answered against the government. This fact will appear more clearly from a somewhat detailed consideration of the two cases.

The De Lima Case.—In the *De Lima* case, which challenged the right of the executive branch of the United States government to collect duties on Porto Rican

imports in accordance with the Dingley tariff "on foreign goods," the court decided 5 to 4 that such collections were illegal. Justices Fuller, Harlan, Brewer, Peckham, and Brown, in delivering the majority opinion of the court, stated that a foreign country was one "exclusively within the sovereignty of a foreign nation, and without the sovereignty of the United States." Obviously, Porto Rico did not fall within this category, but had become, after the ratification of the Treaty of Paris, a territory of the United States, although not an organized Territory in the technical sense of the word. As a territory, however, it came within the mandate of the Constitution that "this Constitution and the laws of the United States which shall be made in pursuance thereof; . . . and all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land." And as coming within this mandate the Dingley tariff was automatically debarred as respects Porto Rico. To the argument that territory acquired as had been Porto Rico remained nevertheless foreign in respect to the tariff laws until Congress formally embraced it within the customs union of the States, the court stated that this contention assumed that a territory might be at the same time both domestic and foreign—domestic for one purpose and foreign for another—in which supposition it was unable to acquiesce. The minority opinion in the case, written by Justice McKenna, and concurred in, in the main, by Justices White, Shiras, and Gray, stated that the majority opinion took a perfectly simple, logical position, unsuited, however, to the complexities and exigencies of national affairs. That position was that a territory must be either absolutely foreign or entirely domestic; that is, that it must be as foreign to this country as the Russian empire, or as domestic to it as New York State. In the opinion of the minority, however, such an argument flew in the face of precedent, expediency, and constitutional law. Distinctions, said the minority, had always existed between *bona fide* Territories and country formerly subject to another nation and afterwards acquired by the United States. In the latter case mere cession and possession did not bring the acquired country within the government and laws of the United States. Some formal act of Congress or of the Executive was required in addition, and this was shown by the fact that such an incorporating act had been passed in the case of California and Louisiana. Moreover—and this was an argument elaborated by the justices in the following, or Downes, case—while it was admitted that acts of the treaty-making power were binding in effect, at the same time it should be borne in mind that this treaty-making power was not supreme in itself, but was only a power co-equal with that possessed by Congress.

The Downes Case.—The Downes case, following the De Lima case, was the crucial one in regard to colonizing by this country, for while the De Lima case had reference to the transient period which precedes the definite organization of a colony, the Downes case dealt with the Foraker act of Congress establishing a permanent colonial government; and more narrowly the Downes case dealt with the one clause of the Foraker act which was at once of high practical importance and of the most questionable constitutional validity. By that clause—taxing Porto Rican imports—Congress asserted powers as broad as are ever likely to be requisite or desirable in colonial management. Justices White, Gray, Shiras, McKenna, and Brown held in this case that the levying of import duties was legal. The attorney-general, speaking for the administration, had affirmed in this case that even if Porto Rico was a *bona fide* Territory of the United States, still Congress could lay import duties against it; because the prescription of the Constitution that imposts should be uniform throughout the United States applied, as the attorney-general alleged, only to the States, and not to the Territories, the Territories possessing no inherent rights under the Constitution, but only derived rights, of which the right to uniform imposts was not one. Justice Brown, however, was the only member of the court to admit the contention that the Constitution drew its power from the States as such, and not from the people of the States and Territories. The other four justices, while agreeing with Justice Brown in his conclusion that import taxes against Porto Rican goods were legal, ascribed their legality to the fact that Porto Rico was not a *bona fide* Territory, but, as they stated in the De Lima case, merely a possession of the United States. The justices (McKenna, Shiras, Gray, and White) admitted that there were certain fundamental prohibitions expressed by the Constitution which Congress was bound to observe, whether legislating for States, Territories, or possessions. Thus Congress could not countenance slavery in any place whatever, subject to the jurisdiction of the United States; and the rights of all men as to their life, liberty, and property must be observed. Congress, therefore, could never exercise such extensive powers in dependencies of the United States as would in effect violate the old English "Bill of Rights." Moreover, it was stated generally that when any particular provision of the Constitution anywhere applied, then that provision could not be violated by the action of any or all of the departments of the government; the Constitution was supreme and untrammelled. The

question was not whether Congress could disregard the Constitution as to the uniformity of import duties, for the contention of the attorney-general that it could be so violated was not admitted by the court (Justice Brown excepted); but the question was whether Porto Rico was a regularly incorporated Territory of the United States, so that this particular provision of the Constitution applied. The founders of the Constitution, the justices said, intended that the United States should be a fully sovereign nation, as is shown by many clauses of the Constitution. Now among the attributes of a sovereign nation is the power to acquire territory. But if territory is acquired by a sovereign nation in accordance with the law of nations, then in accordance with the same law that sovereign nation has also the right to determine upon what terms that land shall be acquired and what relation it shall bear to the acquiring nation. If the nation is permitted to acquire territory and is at the same time denied the right to determine the disposal of the land acquired, then that nation is thereby stripped of one of the essentials of sovereignty. Now it is insisted (by Justices Fuller, Harlan, Brewer, and Peckham, writing the minority opinion in the case) that while the United States may acquire territory, still that territory when acquired becomes immediately incorporated in the United States. If this is conceded, then the treaty-making power is at once aggrandized and minimized. It is minimized because forbidden to make such provisions as are suitable to the political and social status of the inhabitants of the acquired territory and because, furthermore, it is forbidden to make conditions suitable to the exigencies of international policies and situations however important they may be. On the other hand, the treaty-making power is aggrandized because it is allowed to subvert the institutions and the government of the United States; for if millions of aliens, strangers to American laws and customs, can be admitted by the President and Senate to full fellowship with the citizens of the United States, then there is no guarantee for the stability of democratic institutions. All clauses of the Constitution must be interpreted in conformity and in harmony with each other. Therefore, it is obvious that the clause prescribing uniformity of import duties throughout the United States is incorrectly interpreted when it is allowed to overthrow all the others. That this principle has been uniformly recognized by the government is shown by the fact that excluding the treaty with Spain there has not been a single cession made from the time the constitution was drawn up to the present, which has not contained stipulations to the effect that the United States through Congress would either not disincorporate or would incorporate the ceded territory; but the Treaty of Paris contains no such stipulation. It says merely that "the civil rights and political status of the native inhabitants of the territories hereby ceded to the United States shall be determined by Congress." Now, Congress did not, by the Foraker act, and has not as yet, incorporated Porto Rico. Whilst, therefore, in an international sense Porto Rico is not a foreign country, since it is subject to the sovereignty of and is owned by the United States, it is foreign to the United States in a domestic sense. That is, it is not a *bona fide* Territory, but only a possession, and therefore the import duties laid against it by Congress are legal.

In dissenting from the opinion of Justices White, Gray, Shiras, McKenna, and Brown, Justices Fuller, Peckham, Brewer, and Harlan pointed out that four justices of the majority disagreed widely in their reasoning from the fifth, and that the majority simply concurred in conclusions reached from opposite premises. They then asked what the Foraker act did effect if it did not regularly incorporate Porto Rico, for by the Foraker act a complete civil government was instituted for Porto Rico; its officers were required to swear to uphold the Constitution of the United States; the laws of the United States, except as locally inapplicable, and as otherwise directed, were ordered to apply to Porto Rico; a district court of the United States was established in Porto Rico, and from this court, as well as from the supreme court of Porto Rico, it was enacted that appeal could be taken to the supreme court of the United States, "in the same manner and under the same regulations and in the same cases" as from the supreme courts of the Territories of the United States. To the argument of the majority that the United States would be deprived of an element of sovereignty if it were not permitted, as under international law, to dictate the terms upon which alien territory might be acquired, the minority answered that not international law but the Constitution was the supreme law of the land. In fact, international law had nothing to do with the case. For the government of the United States was a government of enumerated powers, and these powers were limited to those plainly consistent with the letter and spirit of the constitution. But the letter and spirit of the Constitution dealt with States and Territories only, and not with that kind of a "disembodied shape in an intermediate state of ambiguous existence" which the majority declared Porto Rico to be. Therefore the United States, when it acquired territory, also bound itself to acquire it only under the terms dictated by the Constitution. With regard to import duties, the terms of the Constitution were clearly laid down by Chief Justice Marshall, when he said; "The

power then to lay and collect duties, imposts, and excises may be exercised, and must be exercised throughout the United States. Does this term designate the whole, or any portion of the American empire? Certainly this question can admit of but one answer. It is the name given to our great republic, which is composed of States and Territories. The District of Columbia, or the territory west of the Missouri, is not less within the United States than Maryland or Pennsylvania; and it is not less necessary, on the principles of our Constitution, that uniformity in the imposition of imposts, duties, and excises should be observed in the one, than in the other. Since, then, the power to lay and collect taxes, which includes direct taxes, is obviously co-extensive with the power to lay and collect duties, imposts, and excises, and since the latter extends throughout the United States, it follows that the power to impose direct taxes also extends throughout the United States." The contrary position taken by the majority assumes, said the minority, that the Constitution created a government empowered to acquire countries throughout the world, to be governed by different rules than those pertaining to States and Territories, and substitutes for the present republican government, a system of domination over distant provinces, by the exercise of unrestricted power.

Other Cases Decided.—On December 2, 1901, the court rendered two further decisions involving the constitutional status of Porto Rico and the Philippines, by which the majority opinions handed down in May as well as the diverse opinions of the separate justices were reaffirmed. The first of these decisions, called the Dooley Case No. 2, instead of questioning the validity of the Foraker act in so far as it levied import duties on goods carried from Porto Rico to the United States, questioned the validity of that same act in so far as it levied duties on goods carried from the United States to Porto Rico. The contention of the plaintiffs was that taxes laid on goods coming from the United States to Porto Rico were clearly in violation of the constitutional mandate that no export duties should be charged on goods going from one State to another. On practically the same grounds, however, by which the Downes case had been decided, five of the justices held against four that the duties were valid, four of the judges, upon the ground that Porto Rico was not an incorporated part of the United States, and one of the judges notwithstanding that it was incorporated. The other case decided in December, called the Fourteen Diamond Ring Case, was as to whether fourteen diamond rings brought by an American soldier from the Philippines, after the ratification of the Treaty of Paris in 1899, should have paid import duties under the Dingley Tariff of 1897. This case was decided on practically the same grounds as had been the De Lima case in May with regard to Porto Rico; that is to say, five justices, handing down the majority opinion, held that with the ratification of the treaty with Spain and the agreement by the United States to pay \$20,000,000 for the Philippines, those islands became domestic to the United States and were embraced in the tariff union at least until Congress should direct otherwise by appropriate legislation. In this case the contention was advanced by the government that the Philippines were not even a possession of the United States in the sense that Porto Rico was; but that the Philippines represented an unconquered territory for which the United States was fighting for military possession. The court held, however, that the United States had clearly asserted its intended sovereignty by the Treaty of Paris and that it was not waging a war of conquest, but rather endeavoring to quell a domestic insurrection.

Significance of the Decisions.—Concerning the significance of the decisions as a whole, these facts may be pertinent. All the justices, with the exception of Justice Brown, held that the Constitution applies *ex proprio vigore* to States and Territories. The eight judges divided evenly not upon the binding force of the Constitution, but as to whether Porto Rico was a Territory, and whether, therefore, the particular clause of the Constitution in question applied. Without exception, the justices held that the rights of life, liberty, and property extended to all places—Territories or possessions—over which the United States holds sovereignty. The practical question decided, and for whose determination the legal one had been brought, was not whether the United States could acquire territory as such, for that had been affirmed by the Louisiana Purchase of 1803, and frequently since, but whether in the pursuit of a colonial policy without precedent and born of new conditions, the United States was to be halted or retarded in acquiring a land thickly peopled with aliens, strangers to American laws and customs, who could only be held as colonists and ruled *ex cathedra* by a system of laws devised for that especial purpose, and administered by appointees of the central government. In the final judgments reached, the opinions of the justices were frankly critical if not judicially denunciatory of each other. The two main judicial sections into which the court was split found, or professed to find, that the other side had been unwontedly swayed by considerations of political expediency and national policy. The judicial precedents set by the court in times past as to what constitutes territory, were interpreted with widely different results; four justices holding to one interpretation, four to another, and the remaining

justice holding to both interpretations at once, the premise of the one and the conclusion of the other. That is to say, neither interpretation was affirmed or denied. Of the five justices who agreed that Congress might impose taxes upon Porto Rican imports under the Foraker act, four only concurred in their course of reasoning. Only in the De Lima case decided against the government was there a majority opinion in substance as well as in form. In the Dred Scott decision, the court also stood five to four, but in that case Chief Justice Taney was on the majority side, whereas in the insular cases Chief Justice Fuller, in the main case at bar, sided with the minority. Finally, as stated by Representative McCall, and as commonly conceded, "it can be said without disparagement of the other justices, that the Titans of the court, with the exception of Justice Gray," stood solidly against the administration. For these reasons it was suggested that the colonial question was not irrevocably settled under the decisions, but that it might at some future time and in a different phase and with another personnel constituting the court, again be brought to bar. On the other hand, it was alleged that the necessity which is forcing great nations, the United States included, to colonize increasingly, would entail upon the United States national and international policies of so momentous a character that theories could not be allowed to misdirect them. As the Dred Scott decision, aimed in effect against an accumulating mass and weight of practical fact, was itself tacitly if not avowedly overruled, so conversely, it was said, the decision of the court in the insular cases would by the impact and compelling power of events, be reaffirmed, compacted in doctrine, and extended by corollary and deduction.

UNITED STATES FISH COMMISSION. See FISH AND FISHERIES and ZOOLOGICAL EXPEDITIONS AND STATIONS.

UNITED STATES MILITARY ACADEMY. See MILITARY ACADEMY, UNITED STATES.

UNITED STATES STEEL CORPORATION. The incorporation in New Jersey on February 25, 1901, of the United States Steel Corporation, with a capitalization at first fixed at \$3,000, but almost at once increased to \$1,404,000,000, gave rise to a large amount of discussion both as to the reasons which had led to the formation of the trust, and the factors by which its financial stability should be judged.

Causes Leading to the Formation of the Trust.—As originally formed, the trust included eight companies, each of them in turn a combination of companies; and though the trust subsequently acquired two additional companies, the impelling reason for the trust's formation was the attitude in which, prior to consolidation, the original eight companies stood to each other, and especially the position that one of the eight took to the other seven. Of the eight companies, the Carnegie Steel Company, the Federal Steel Company, and the National Steel Company were manufacturers of primary steel products—plates, bars, billets, etc. The other five, the American Steel Hoop, American Sheet Steel, American Tin Plate, American Steel and Wire, and National Tube, were buyers of primary steel products and converters of them into ties, pipes, tubes, tin plate, sheets, and structural material. Now, under these conditions, it was evident that there would be harmony among the several companies only (1) so long as a satisfactory market was afforded by the five finishing companies to each of the three steel-producing companies, no one of the latter being unduly favored at the expense of the other two, and (2) so long as the producing companies were content to turn out primary products and not encroach upon the market of the steel finishers. But two conditions militated against the maintenance of this *status quo*. In the first place, Messrs. William H. and J. H. Moore were the fiscal managers, not only of the Tin Plate, Steel Hoop, and Sheet Steel, finishing companies, but also of the National Steel, a manufacturing company; and in the second place none of the eight companies, with the exception of the Carnegie company, was in a reassuring condition financially in case of a period of industrial depression. It was therefore necessary, or at least highly desirable, for those companies to increase their profits and render themselves independent by enlarging the scope of their operations, and this they endeavored to do. To reduce manufacturing cost, the Federal Steel Company bought ore and coke land and added to its transportation facilities; the National Steel Company likewise purchased coal and iron mines and started to build a plant that would furnish all the steel material needed by the Tin Plate, Sheet Steel, and Steel Hoop finishing companies. And on the other hand, the American Steel and Wire and the National Tube, finishing companies, allowed it to be known that they also intended to convert their own iron ore and to become independent of the Federal and National Steel, manufacturing companies. Here, then, especially as concerned the American Steel and Wire, which had hitherto been a large customer of the Federal Steel, there was cause for dissension. But beyond and above this was the ultimatum of the Carnegie Company, which had been accustomed to supply many of the mills of the five finishing companies, and which now saw that this market would be cut off, or at least greatly diminished.

In January, 1901, it declared that it would build an independent railway of its own from Pittsburg to the seaboard, start tube mills and sheet mills of its own, carry forward to completion its own primary steel products, and so forge an unbroken chain from the mine to the contractor and buyer, furnishing steel material at prices hazardous to the welfare of the newly organized steel companies.

The Carnegie Company.—That the Carnegie Company had both the inclination and the ability to make good its threat was not thought doubtful by those who had observed the remorseless vigor with which this industrial engine had been driven. The great mills of the company were grouped around Pittsburg, the strategic centre of the steel trade, on a connecting railway; and this railway, in turn, connected with a privately owned road to Lake Erie, where the ore that Carnegie boats brought from the company's mines on Lake Superior was crushed. Every considerable factor of steel production, including a bountiful supply of coke and limestone, was owned or controlled by the company, which was thus independent of outsiders and of fluctuations in the market rates. Unlike the seven companies against which it was now arrayed, the Carnegie Company was owned closely and held by its actual industrial managers, its shares were not on the market, and there were no bills accruing to bankers, promoters, and underwriters. The enormous profits of the concern, estimated for the year 1900 at \$40,000,000, had in great part been habitually used only to replace worn-out engines and to increase the efficiency of the plant; neither men nor money nor tools had been spared to build up the most "splendidly isolated" and independent, the best equipped, and best managed steel business in the country, if not in the world.

Typical Method of Industrial Consolidation.—The financial organization and status of the other seven companies were typical of many, if not most, of the industrial consolidations effected in the United States within recent years, and especially since 1898. Of such consolidations the main features have been (1) the avoidance of a bonded debt and the issue, instead, of preferred stock to an amount roughly equal to the actual value of the constituent plants, and (2) the issue of common stock to an amount corresponding to the additional value hoped for as a result of consolidation. To secure the preferred stock, dividends have then been made cumulative, the preferred stock having this advantage over bonds, that if interest on the stock remains unpaid in any one year, the company would not, as if it issued bonds, be forced into bankruptcy and the financial control of the company be given into other hands. The common stock, as its speculative character denoted, has been largely used as a bonus to induce the several mill and factory owners to relinquish their independent position, and has been also employed for the payment of underwriters and promoters. The following table, which may be taken as fairly typical, shows the date of organization and the amount of preferred and common stock of the seven companies under consideration:

Name of Company and Date of Organisation.	Amount of Stock Outstanding. 7 per cent.	Common Stock.
	Cumulative Preferred.	
*Federal Steel Company—September 9, 1898.....	\$53,260,900	\$46,484,300
American Tin Plate Company—December 14, 1898.....	18,325,000	28,000,000
American Steel and Wire Company—January 13, 1899...	40,000,000	50,000,000
National Steel Company—February 27, 1899.....	27,000,000	32,000,000
American Steel Hoop Company—April 14, 1899.....	14,000,000	19,000,000
National Tube Company—June 16, 1899.....	40,000,000	40,000,000
American Sheet Steel Company—March 28, 1900.....	24,500,000	24,500,000
Total of capitalization.....	\$217,085,900	\$239,984,300
*Dividends non-cumulative and not to exceed 6 per cent.		

As will be seen from the foregoing table, the total amount of common stock outstanding exceeded that of preferred stock, and by about the amount of common stock outstanding the companies were commonly considered to be over-capitalized. As showing the reflection of this over-capitalization upon the value of stocks, the following table, showing the prices commanded by the seven companies from October, 1900 to January, 1901—a period of general buoyancy, if not inflation, of the stock market—may be of interest:

Name of Company.	Common Stock.		Preferred Stock.	
	Lowest.	Highest.	Lowest.	Highest.
Federal Steel Company.....	31¾	58¾	60¾	78
American Tin Plate Company.....	26¾	57½	79½	92
American Steel and Wire Company.....	30½	47½	71½	89
National Steel Company.....	24	43	82	96¾
American Steel Hoop Company.....	17½	32¾	65	79
National Tube Company.....	45¾	69¾	92¾	105½
American Sheet Steel Company.....	25, average		65	79

Both the average low quotations of the stocks as noted above and the wide variations in the quotations indicated that the stocks were not considered by the public as investment so much as speculative securities. Yet it is not improbable that the stocks were sold at higher prices than their actual value warranted, for the companies had, on the whole, paid large dividends. The payment of some of these dividends was ascribed (1) to the fact that the companies wished to protect their stockholders, and (2) perhaps more to the fact that until the market was firm, the promoters and underwriters could not dispose of their holdings to advantage. In any event, as shown by the annual statements of the companies, dividends had been paid to such an extent that the cash resources were unduly low; and it was under these conditions that the companies, being called upon to meet a sudden and violent competition, concluded that consolidation would be a pleasanter alternative.

Plan of Consolidation.—To the eight companies, including the Carnegie Company, comprised in the original plan of consolidation, there were later added the American Bridge Company, controlling about 90 per cent. of the steel bridge business of the country, and the Lake Superior Consolidated Iron Mines Company, a possession of Mr. John D. Rockefeller, having a large iron output, a railroad to Duluth, and freighters on the lakes. To all these companies, except the Carnegie Company, Messrs. J. Pierpont Morgan & Company, syndicate managers for the consolidation, gave stocks, preferred and common, of the new United States Steel Corporation, in exchange for the stocks of the companies to be combined. The ratio of exchange is given below, and by this ratio it will be seen that in nearly every instance the United States Steel Corporation issued far more stocks, par value, than it received:

	Amount and Kind of U. S. Steel Stock to be Delivered in Exchange for every \$100 of Preferred Stock..		Amount and Kind of U. S. Steel Stock to be Delivered in Exchange for every \$100 of Common Stock.	
	Preferred.	Common.	Preferred.	Common.
Federal Steel Company.....	\$110.00	....	\$ 4.00	\$107.50
American Tin Plate Company.....	125.00	....	20.00	125.00
American Steel and Wire Company.....	117.50	....	....	102.50
National Steel Company.....	125.00	....	....	125.00
American Steel Hoop Company.....	100.00	....	....	100.00
National Tube Company.....	125.00	....	8.80	125.00
American Sheet Steel Company.....	100.00	....	....	100.00
American Bridge Company.....	110.00	....	....	105.00
*Lake Superior Consol. Iron Mines Co.....	....	....	135.00	135.00

*No preferred stock.

As shown in the first table, the total capitalization of the seven companies first acquired, exclusive of the Carnegie Company, was \$217,085,900 in preferred stock and \$239,984,300, in common; in exchange for these stocks the Steel Corporation gave, as per the published rates of exchange, \$261,452,612 of preferred stock and \$269,720,623 of common, a net increase of \$74,103,035. But these seven companies were already estimated to have been over-capitalized to about the extent of their common stock; so that to \$240,600,000 of "water," \$74,000,000 was added, or, as the *Journal of Commerce* remarked in effect, inflation was heaped on inflation, and the capitalization ceased to be any measure of the real potency of the combination. The American Bridge Company and the Lake Superior Consolidated Iron Mines Company, subsequently acquired by the corporation, were capitalized respectively at \$61,055,600, equally divided between common and preferred stock, and at \$28,722,000. For these two properties the trust paid in stock: For the American Bridge Company, \$65,634,770, and for the Lake Superior Company, \$77,549,400. To sum up, the corporation bought, exclusive of the Carnegie Company, nine corporations, with an aggregate capital of \$546,847,800 in stock, and paid for this stock by giving its own stock to the extent of \$674,357,405. But the total amount of stock that the Steel Corporation had authorized itself to issue was \$1,100,000,000, divided between common and preferred—\$550,000,000 of common stock and \$550,000,000 of cumulative 7 per cent. preferred stock. Thus, if the *actual* over-capitalization of the Steel Trust, that is, the actual amount paid for the properties acquired, be left entirely out of account, there remained a further *potential* over-capitalization representing the difference between the total capitalization of the Steel Trust and the amount of that capitalization remaining after the properties acquired had been paid for; that is, the difference between \$1,100,000,000 and \$674,357,405, or \$425,642,595. That a small part of this sum would be used to acquire further properties as time and occasion warranted was generally asserted; that a considerable sum, also, would be used, or had been used, to pay bonuses and promoters', underwriters', and bankers' commissions, was, of course, inevitable from the nature and genesis of the consolidation, and to the amount that such bonuses and profits were paid the industrial stability of

the corporation would be diminished, since these payments represented no gain whatever in the company's earning power.

A further factor, however, of the trust's organization, demands consideration. The immediate compelling power that induced the whole consolidation was the threatened competition of the Carnegie Steel Company. To retire Mr. Carnegie from the steel business was a main purpose of the trust's organizers, and Mr. Carnegie had, it was understood, expressed his willingness to be retired, provided that his price were paid. The prestige and industrial solidarity and independence of the Carnegie Company warranted the payment of the price. As a first lien and mortgage upon all the assets of the United States Steel Corporation was placed an issue, in addition to all stock issues, of \$304,000,000 in bonds. These bonds were issued (1) dollar for dollar in exchange for the bonds of the Carnegie Company, amounting to \$160,000,000, and (2) dollar for dollar for 60 per cent. of the stock of the Carnegie Company, which aggregated also \$160,000,000. For the remaining \$54,000,000 of stock of the Carnegie Company not covered by the bond issue, was paid, presumably, stock of the Steel Trust or stock and cash, but to what amount and in what ratio was not made public. The interest on the bonds was fixed at 5 per cent., and only so long as this interest was paid would the Steel Corporation be entitled to vote upon its stock issue, which had thus been mortgaged in its entirety. In other words, a fixed charge of \$15,200,000 annually was created, and the penalty for its non-payment would be to throw the control of the corporation and the interests of its stockholders back to Mr. Carnegie and his partners or their assignees.

The Financial Stability of the Corporation.—As organized, the United States Steel Corporation controlled, as was computed, about 70 per cent. of the steel business in the United States. Outside of the trust, to be sure, there were numerous steel companies of undoubted strength; but there was none which controlled at once raw material and complete transportation facilities, and at the same time possessed such a central location as Pittsburg in the iron trade. Moreover, the Steel Trust, through its influence over, and association with, large financial interests, would probably be able, in case of serious competition, either to buy up, or to nullify by quoting lower prices, any antagonistic plant, at least in the near future. So far, then, as its commanding position in the steel trade was concerned, the United States Steel Corporation might probably be considered as an essentially stable concern. Whether its financial basis was equally stable was not, however, so certain, and in view of the enormous capitalization of the company, this question was periodically recurrent in the press of both America and of Europe during the year. On the whole, those factors which went to prove the investment standing of the stocks of the Steel Trust might be called fortuitous; that is to say, they were not inherent in the organic structure of the company, but depended upon the personality of the men who controlled the company. The president of the company was Mr. Charles M. Schwab, who had risen from the ranks of steel workers, and whose position in the new company was well known to have resulted solely from his mastership of the practical, executive, and administrative sides of the steel business. The financial organizers of the trust were Messrs. J. Pierpont Morgan & Company, who not only possessed large financial resources themselves, but who commanded, more than any other banking house in the United States, the confidence and purses of other large financial interests. In accordance with their reiterated policy of uniting rather than of crushing possible competitive powers in the industrial and banking world, the directorate of the United States Steel Corporation, nominated by Messrs. J. Pierpont Morgan & Company, was made to include directly large interests in several of the great trunk railroad lines, coal companies, and industrial combinations of the country, and indirectly many more. By the nomination of this directorate, as was asserted, the Morgan Company not only placated potentially hostile capitalists, but insured their cooperation in time of need in maintaining the financial stability of the trust. In pursuance of the same general plan of enlisting public confidence, the Steel Corporation elected, as had very few recent industrial combinations, to publish quarterly a comparatively full statement of its current earnings and indebtedness. Thus the public, who were asked to invest in the stocks of the trust, were given at least a fair opportunity of knowing its standing, and whatever happened, no blind pool could be alleged against its organizers and sustainers. Finally, although the condition of the steel trade would have allowed a heavy advance in steel prices, the trust preferred to maintain them as they were, desiring stability in the trade rather than a temporary and necessarily reactionary buoyancy. In brief, then, the main factors that tended to reassure investors of the financial worth of the stocks of the largest industrial company in the world were based principally upon the honesty, ability, and financial backing of its organizers, managers, and promoters.

On the other hand, and from a more organic standpoint, there were certain disquieting features in the gross amount of the company's capitalization, in its fixed charges, and in the ratio in which the fixed charges were likely to stand to profits in

a time of industrial depression. It was generally insisted by financial journals of repute that the years 1900 and 1901 had marked an extraordinary era of prosperity in that most fluctuating of trades, the steel trade. The question, then, concerning the investment value of the trust's stocks was whether the company could lay by such a large surplus in days of prosperity as to tide it over in times of depression, and at the same time allow it to pay regular dividends, at least on the preferred stock. As a partial answer to this question, the statement of the earnings of the Steel Corporation for the first six months of its existence may be considered. Those earnings from April to September inclusive were, roughly, \$55,000,000, or at the rate of \$110,000,000 a year. If it be assumed that these earnings would not decline, even in a year of industrial depression—and this is probably an erroneous assumption—the following conclusions may be drawn roughly and to a certain extent inaccurately: At the time of the semi-annual report there were outstanding some \$507,000,000 in common stock and some \$510,000,000 of preferred stock; but it may be assumed, probably without large error, that the total capitalization of the company will soon be issued, and that the fixed charges of the company may be computed on the entire capitalization of \$550,000,000 common and of \$550,000,000 preferred stock. The fixed charges of the company would then include: (1) \$15,200,000 interest on the bonds issued; (2) \$38,500,000 on the 7 per cent. preferred cumulative stock; and (3), at the rate announced in the Steel Corporation's first statement, \$14,000,000 for maintenance and construction. The aggregate of these charges would be \$67,700,000. Now, if there is added to this sum dividends on the common stock, and these dividends are requisite to prevent the common stock from greatly deteriorating in value, the fixed charges are increased by \$22,000,000, bringing the sum total up to \$89,700,000. If the total earnings announced by the Corporation for the first half year are continued, there would remain out of the \$110,000,000 earnings per year, after the fixed charges had been met, \$43,000,000 if no dividends were paid on common stock, and \$21,000,000 if dividends on common stock were paid. The surplus, then, would amount in the one case to about 3 per cent. of the trust's total capitalization, and in the other case to about 1.5 per cent. That such a surplus in the case of any ordinary industrial concern is grossly insufficient to meet fluctuations in industrial conditions is obvious; and in the case of the trust it would not even suffice to pay dividends on preferred stock for more than a year, or on preferred and common stock, taken together, for more than eight months. Such a surplus is in fact so inadequate as not to suffice even for a proper surplus for additional costs of maintenance and new construction. But it is argued in the case of the Steel Corporation that the gross demand for steel products is, even at its minimum, so constant, and that the Steel Corporation as an industrial enterprise is so highly organized that practically no surplus is needed. To this view, several persons of no mean authority in the steel trade have given their assent, and it is also incredible that a house of such wide financial interests outside of the steel business as that of Messrs. J. Pierpont Morgan & Company should give their assent to any form of organization which they considered involved serious financial danger. Nevertheless, it has been pointed out again and again that no industry is more fluctuating than the steel trade. Railroads and other large corporate interests invest heavily in times of commercial prosperity and almost entirely withhold their orders on account of the large cost in times of depression. As Mr. Carnegie has picturesquely put it, in the steel business one is either and alternately a prince or a pauper. Is it probable that the Steel Trust would be independent of the vast fluctuations which have hitherto taken place in the steel trade, or that such fluctuations would no longer occur? If they do occur, would the Steel Trust be more able to withstand them than an ordinary and unintegrated steel business? On this point a valuable suggestion has been made by Mr. Edward Sherwood Meade, of the University of Pennsylvania. Mr. Meade suggests that while it is obviously true that a concern like the Steel Trust, owning all the factors of production from the ore to the completed product, is able in time of prosperity to produce much more cheaply than a steel company controlling but one factor of production; yet at the same time it follows from this very fact that such an integrated concern as the steel trust is likely to suffer the most severely in case of a pronounced or prolonged industrial depression. For while a separate company owning but one factor of production is able to produce much more cheaply in times of depression, owing to the fact that every other factor of production upon which it is dependent is coincidentally reduced by the depression, a company owning every factor of production cannot thus reduce its expenses, because it has previously placed every factor of production upon practically a cost basis, and has capitalized, at least the Steel Trust has, the total economies resulting from the ownership of every factor. Mr. Meade argues, therefore, that the fact that the Steel Trust in the first six months of its existence, when orders for steel were only limited by the producing capacity of the mills, was not able to earn such profits as would lay up for itself a huge surplus fund, is evidence of no mean

moment that the value of the steel stocks cannot survive in time of industrial depression. It may be added here that an indirect but potent corroboration of Mr. Meade's general theory, at least in its conclusion in popular estimation, is to be found in the fact that, notwithstanding that the Steel Corporation was financed by the strongest banking houses in America and backed besides, as was commonly believed, by several of the great railroad and industrial interests, its common stock during the year did not rise above 43, although 4 per cent. interest was paid upon it, or its preferred stock above 94, although 7 per cent. was paid upon it.

UNIVERSALISTS, a denomination that asserts its belief in the final salvation of man, originated in the United States in the latter part of the eighteenth century through the teachings of the Rev. John Murray. In 1901 the church had 52,873 members, with 746 ministers and 772 churches. The biennial session of the general convention, which is the highest body of the church, at Buffalo, October 18-23, was reported as the largest and most satisfactory in the history of the denomination. The changes effected at the convention in Boston two years before in "making the general body more democratic by increasing its size, and in abrogating the law requiring creedal affirmation as a condition of fellowship," left their impress on the assembly of 1901 in the lack of factional elements and in a broader sympathy with the problems of the future, the discussions dealing with sociologic rather than purely religious themes. The most important feature of the convention was its decision in regard to the Unitarian overture, upon which a preliminary joint meeting of representatives of the two bodies was held in 1900, the convention providing for the appointment, every two years, of a committee of five, "to confer with a like committee of the American Unitarian Association, with the distinct understanding, however, that such committee shall not have or exercise joint missionary functions; that it shall be its duty only to consider cases where there may be a conflict of interests, duplications of missionary efforts, or where friction has arisen, or is likely to arise, between representatives of the two bodies; that it shall endeavor to promote harmony, by judicious and Christian counsel, and that, in case of failure to secure harmonious results it shall report, with recommendations, if it sees fit, to the board of trustees." A spirited discussion arose over the resolutions introduced by the temperance committee opposing the repeal of the anti-canteen law and affirming uncompromising opposition to the liquor traffic; and upon the report of the committee on penology, the convention recorded its judgment in favor of life imprisonment, as against capital punishment. Reports for home missionary work indicated the gain of some 2,000 members in the last 2 years, with notable growth in the South, and the addition of 26 new churches and 4 in course of erection. To the Twentieth Century Fund more than the projected \$100,000 has been subscribed, but the canvass will continue until that amount actually be received. Dr. Isaac M. Atwood, as general superintendent, was retained in office, in recognition of his efficient service. The financial statement for the year shows receipts of \$68,740, of which \$16,749 was obtained in gifts and bequests, and expenditures of \$66,465, including \$14,315 devoted to home missions and \$8,759 to the mission in Japan. Total gifts to the general and State conventions, and other bodies for missionary and other benevolent enterprises were reported as \$77,746 in 1900, and \$56,324 in 1901; expenditures, \$62,176 in 1900 and \$65,271 in 1901. Educational institutions under Universalist control received in 1901 \$105,815, while to the permanent funds of the conventions and other incorporated missionary bodies \$12,304 were added, making an aggregate of \$813,000. The general convention in 1903 will meet in Washington, D. C. President, Hon. W. D. Washburn; secretary, Rev. G. L. Demarest, D.D., Manchester, N. H.; treasurer, F. W. Wise.

UNIVERSITIES, AMERICAN, ASSOCIATION OF, a national association in which 14 leading universities are represented, holding annual conferences of an informal, non-public nature. At the second annual meeting, held at Chicago, February 26-28, 1901, the chief topics under discussion related to inter-university migration of graduate students; fellowships; and the examination for the degree of Ph.D. No resolutions were passed, but it was the sense of the universities that the furtherance of migration among graduate students was advisable, though for the present under limitations; that the provision for university fellows is too large, and that there is danger of stimulating unduly to engage in investigation and research a number of men who have not the best and highest qualifications for such work; and, among other things, that the growing tendency to hold examinations for the doctor's degree upon courses of instruction rather than upon subjects should be checked, this opinion being based upon the principle that such courses are but a small part of the work the candidate is supposed to do in order to prepare himself for his examination. Officers for 1901-02: President, Columbia University; vice-president, Michigan; secretary, Chicago; other members of the executive committee, Harvard and California.

UNIVERSITIES AND COLLEGES. During the year 1900-01 marked advance was made in the tendency toward cooperation among institutions of higher learning as a substitute for the old-time rivalry. The successful year of the College Entrance Examination Board for the Middle States and Maryland merits fuller discussion later in this description. This has led to the adoption of uniform entrance requirements by most of the colleges in that territory, Princeton University being the latest to fall in line. The effort to encourage in the university migration on the part of advanced students is a part of the same movement toward friendly cooperation. One other important movement of this character is that led by the Congressional Library (*q.v.*) and seconded by the suggestion of President Eliot, of Harvard, in regard to university libraries. The main suggestion is that books be divided into two groups, the "living and the dead," and that most educational institutions confine themselves to a collection of books in constant demand, leaving a few large central libraries to attempt the vast collections of those which are used only rarely, especially by research students. President Eliot says: "It may be doubted whether it be wise for a university to undertake to store books by the million, when only a small proportion of the material stored can be in active use. Now that travel and the sending of books to all part of the country have become safe and cheap, it may well be that great accumulations of printed matter will be held accessible at only three or four points in the country, the great majority of libraries contenting themselves with keeping on hand the books that are in contemporary use, giving a very liberal construction to the term 'contemporary.' If the Congressional Library, the combined libraries in New York City, and the combined libraries in Chicago would undertake to store any and all books, making them accessible to scholars in every part of the country, the function of the thousands of other libraries in the United States might safely be considerably simplified." These suggestions were called out by the fact that the Harvard library now numbers nearly 600,000 volumes, and accessions are made at about the rate of 13,000 volumes a year; and yet from the central library of nearly 400,000 volumes less than 64,000 books were drawn during the year. The action of the Congressional Library in furthering the cooperative movement by the distribution of printed catalogue cards is described in the article on that library.

Uniform College Entrance Examinations.—By far the most significant movement of the year 1901, looking toward the unification of the work of the university and the secondary school, and a simplification of the matter of entrance requirements, has been the most successful inauguration of the work of the College Entrance Examination Board of the Middle States and Maryland. This promises to effect the most far-reaching reform of any movement inaugurated within the last decade. The assumption upon which the board is organized is that college admission examinations are not a series of puzzles which the college sets, to find out whether the high-school pupils can solve them, but that the examinations are a means of testing whether a pupil is ready to go forward with advantage, from one teacher or institution to another. The board set to work at once to define the requirements in each entrance subject, to appoint examiners to frame questions, to arrange time schedules, issue instructions, and appoint readers and secretaries to carry out the plan. The institutions uniting to carry forward the plan were Barnard College, Bryn Mawr College, Columbia University, Cornell University, Johns Hopkins University, New York University, Rutgers College, Swarthmore College, Union College, University of Pennsylvania, Vassar College, Lehigh University, Washington and Jefferson College, and Western University of Pennsylvania. Invitations to cooperate were extended to universities generally, and official assurances were received from every institution addressed except Bowdoin College and Harvard University. Nearly all of the leading universities agree to accept the examinations set by the board as a substantial equivalent of their own. The examinations were given June 17-22, at 69 places in America and two in Europe, and 973 persons applied for examination. The results were all that could be asked for, and are clearly stated in the first report of the secretary of the board in the October number of the *Educational Review*. As a contribution to educational progress, the successful organization of this board is second to no other of the past ten years. It means "the breaking down of barriers to sound secondary and collegiate education which have long existed, and the carrying of high and well-defined standards of teaching and of testing into secondary schools, public and private, in every part of the United States. It will control the examination system in the interests of education, and resist the tendency to make it a mere machine-like performance."

The Elective System.—The policy of allowing to freshmen in the so-called arts courses a considerable freedom in selecting the studies which they wish to follow made additional progress during 1901, and the principle of liberty of election in all classes above freshman has been greatly extended. In the western colleges, where the hampering influence of traditions has been far less than in the East this principle

has been established for some time. Harvard was the first of the important eastern institutions to adopt the elective system, and has been the most prominent exponent of it. After fifteen years of observation of the system, the conclusion of the Harvard authorities is that a boy with proper training may use the system wisely; with improper training, he will accomplish more than under any other system; with his future career determined, he needs free election; without any knowledge of his chosen profession, he should choose in those fields where he takes most pleasure, and where he may be able to excel. In the West, the Leland Stanford, Junior, University has been the most prominent exponent of the system. At Harvard all courses are elective except the one requirement of English; at Stanford all work is elective, though subject, of course, to the requirements of the major subject. The Stanford theory is that a man should choose his own field of work; that having once chosen his work he should be required to follow up this selected line of work to the extent of a fourth to a third of his college course, thus becoming proficient in some one line; and that the student should be allowed liberty of election in other fields. The general experience has been that students choose, as a whole, wisely; that the selections made by individual students more nearly suit individual needs than would any possible system of "grouping"; that there has been but little tendency to "snap hunting"; that the students tend to elect the courses which are of greatest value and to take work under the men who are most worth listening to; and, probably most important of all, that the system has led to a competition in teaching itself, which has been most beneficial to the university. The poor teacher or the teacher whose work possesses little content is soon eliminated by reason of his having few students to teach. The University of Indiana has occupied a middle ground for the past fifteen years, a small number of subjects being required, and these usually being taken in the freshman year. The student selects his major department and then elects the remainder of his work. Quite generally the older subjects have held their own under the elective system, and at a number of institutions they have gained. Freed from the "protective tariff" levied in their favor, they have been forced to stand on their own merit and the teaching ability of the professors, a condition which has been alike beneficial to the subjects and the students. At Yale the work in the senior year has been made entirely elective, and the principle of election has been extended down into the sophomore year. This was done "in order that the graduate of Yale College might stand on the same level in beginning his professional studies which is attained by the graduates of other first-rate colleges of the present day." The result of the elections so far made by the sophomores has been most satisfactory. No particular change was made in the work of the freshman year at Yale, as "any change in freshman year in the academic department," writes the president in his annual report for 1901, "means a practical abolition of the required study of Greek. For if a boy is not compelled to use Greek in his freshman year it is neither logical nor possible to require him to furnish it in his entrance examination; and the abandonment of this demand would mean a radical change in the whole course of study of many of our preparatory schools." The year has seen a number of changes at other institutions. The University of California has extended the elective system a little, though retaining the group system, and has modified its entrance requirements in response to a strong demand from the secondary schools of the State. The changes have been in the nature of a compromise, in which a number of reductions of fixed requirements have been made and the options extended; and then, by way of compensation, two years of Latin are to be required of *all* entering students. At Western Reserve University the studies of the last three years of the course have been made entirely elective, with a slight exception, but elective under these conditions: The studies of the course have been divided into three groups. The first consists of those which represent languages and literature; the second of those which represent science and mathematics; and the third of those which represent philosophy, history, and social and economic science. From each of these three groups, each student is required to take four three-hour, half-year courses. In other words, four-tenths of the work above freshman year is indicated, though the student has liberty of election within the groups. One hour of English is also required throughout the sophomore year.

Professional Studies in the College Course.—The year 1901 saw further extension of the principle of allowing the student, during his college course, to elect a portion of his work in the line of his future life-work. At the University of Pennsylvania a student may now elect the first year's work in medicine as a part of his work for the baccalaureate degree, thus making it possible for the student to take both degrees in seven years instead of eight. Northwestern University has recently made the same arrangement. At Northwestern, Princeton, and elsewhere, it has been made possible for the candidate for the B.S. degree to elect as undergraduate work two of the four years of professional work in engineering, thus reducing his engineering course to two years in length. At Leland Stanford, Junior, University a three years'

graduate law school has been developed, but so organized that an undergraduate may complete the first year of his law course as part of his undergraduate work. These changes are in large part a result of the extension of electives, the university now recognizing educational value in studies which formerly were not thought worthy of being accepted in partial fulfillment of the requirements for the B.A. degree. The effect of these changes is to make it more easy for the professional school to become a graduate school, and to allow the student to take his bachelor's degree in three years. Whatever may be the opinion as to the advisability of thus shortening the college course, there is no mistaking the strong tendency in that direction. In a certain sense the movement toward major subjects and the introduction of professional studies into the college curriculum is a working out of the doctrine which Agassiz stood for so strongly, viz., that whatever was to be a man's future life-work, the sooner after entering college he came in contact with its subject matter and began to think about it, the better. Professor C. S. Smith, of Harvard, writing in the *Atlantic Monthly*, thinks that the abridgment of the undergraduate course will be one of the next general advances in education. "There is no danger now," he says, "as would have been the case thirty years ago, of turning the student away at the end of that time. The growth of graduate schools has familiarized every student with the fact that the bachelor's degree is no longer the crown of a liberal education, but only the first degree in arts. This is true, not only of the universities, but of the independent colleges, for the best of which it would not be difficult to provide two or three additional years; and there is ground for confidence that the number of those who would take such an extended course would be considerable."

Junior Colleges.—In close connection with the foregoing is the movement to induce the smaller and weaker denominational colleges to drop the junior and senior work, which they can no longer do satisfactorily in competition with the larger institutions, and to concentrate their energies and their very limited revenues upon the work of the freshman and sophomore years. This they could do well, as the equipment required is not extensive. The main thing necessary is a good teacher, and much better teachers could be secured if these schools were able to pay a larger salary than they now do. Many of the smaller denominational colleges are straining every nerve to try to keep up with the stronger and better endowed institutions, scarcely realizing how far they are already behind, and are starving their professors and spinning out their slender resources until the work done has of necessity become very weak. The movement, really inaugurated by the University of Chicago, has been to induce these schools to drop junior and senior work, taking the rank of junior colleges, and to grant to their graduates the new degree of associate in arts. It will only be a few years until the larger high schools of the country will have reached the same rank as these junior colleges.

Research.—One important aspect of educational development in 1901 was the encouragement given to research, and the general emphasis of the fact that the importance of investigation has not been recognized. The burden of many magazine and newspaper articles has been that the indifference of the American public, and especially the professional classes, to the work of research was a reproach. Few of the great medical discoveries and few of the advances in pure science in recent times have been made by American students. The past year's work at least lays the foundation for better things. First came the offer of Mr. John D. Rockefeller to give \$1,000,000 for the endowment of medical research, and the placing of one-fourth of that sum in the hands of a board of trustees including some of the most eminent physicians and scientists of the country. This endowment is to be connected with no university or established institution, but is to be used solely for the support of specially adapted investigators and for experimentation. Since the medical profession has taken great interest in this movement, there is promise of much greater support in the future. Mr. T. Jefferson Coolidge made to Harvard University a gift of \$50,000, the income of which was to be used primarily for laboratory expenses of original investigation by members of the staff of Jefferson Physical Laboratory, and no part of the fund is to be used for current expenses or salaries. This, together with the offer by the Prussian government of a full professorship in the University of Göttingen to Professor T. W. Richards, in recognition of his researches in chemistry, gives opportunity for President Eliot to emphasize, in his annual report, the function of the university in matters of research. The Association of American Universities discussed the question of fellowships with the conclusion that there should be a concentration of the funds so applied to the support of a few men capable of prosecuting advanced work, rather than multiplying the number and dividing the remuneration among those who were rather engaged in general study than in work of research character. The committee of the National Education Association on the National University, supported in its opinion by the great majority of prominent educators, was of opinion that such a university located in Washington should devote

itself wholly to research and thus supplement rather than compete with existing institutions. But the gift of Mr. Andrew Carnegie came as a climax to this movement and lays the foundation of a much greater work in the future. As explained more in detail in the article on the Carnegie Institution (*q.v.*), the income from the fund of \$10,000,000 is to be used in support of research work in all lines, and the man exceptionally well prepared or well qualified for work in the advancement of knowledge is to be assisted whenever and wherever he can be found. This new institution is not a university in the sense of a teaching body, but is merely to be a body of investigators. A board of trustees drawn from all parts of the country, and including men famous in most diverse lines of human activity, is to have direction of this fund. One further evidence of growth in this higher aspect of educational endeavor is to be found in the rapidly growing number of graduate students in all the large universities. Some of these institutions have shown an increase of 300 per cent. in the number of such students within the last three years.

Development of Professional Schools.—In previous years attention has been called to the advance being made in both medical and law schools in raising the standards of admission. The preliminary announcements of the newly founded law department of the University of Chicago, state that it is to be a graduate school. By 1904 the Columbia University law department will be established likewise, and these with Harvard will give the law schools a standing held by no other professional schools. While an effort towards the same goal is being made by the medical departments of some of the universities, its consummation cannot be expected for some years. The most marked feature of the year 1901 in regard to professional training is the development of departments of education in various universities. Following the great expansion of the Teachers College of Columbia University, the new school of education of the University of Chicago, and the reorganization of the School of Pedagogy of New York University, are the formation of similar schools at the University of Wisconsin, Brown University, and Leland Stanford, Junior, University, while plans are announced for similar schools at the University of California and the University of Cincinnati, with somewhat inchoate plans at other universities. The largest attendance upon these schools is at Teachers College, Columbia University, where the student-body has grown from 196 in 1898 to 317 in 1899, 448 in 1900, and 557 in 1901. This is exclusive of 721 extension students and more than 300 taking educational courses during the summer session. More significant than the growth in total registration is the growth in graduate students from 51 in 1898 to 162 in 1901. See PROFESSIONAL SCHOOLS.

Athletics.—Steps towards the solution of some of the difficulties connected with college athletics were made during 1901. The appointment of a supervisor of student organizations at Columbia University is a most important innovation. Despite the large amount of funds raised or received from gate returns, many of these student organizations have been constantly in debt, and by their extravagance and lack of continuity in administration, and hence of responsibility for the expenditures of the past, have created much difficulty for the university authorities. Hereafter no student-body can make an expenditure without the approval of the supervisor, an approval based upon a knowledge of the organization. This simply provides a business administration for such enterprises, including not only athletic but musical and literary organizations as well. The cooperation of the new official with the faculty committee on athletics is apt to free college athletics from some common reproaches.

The year was marked by the usual amount of undergraduate recriminations concerning the make-up of the athletic teams, with some actual demonstrations of professionalism among the members of such teams. As yet the whole effort of the undergraduate bodies seems to be directed towards discovering violations of rules by opposing teams, instead of towards keeping their own teams up to the standards. Of recent years college athletics have been fostered not only with the idea that the health and intellectual welfare of the students would thus be improved, but that prowess in such contests was the best advertisement that an institution could have, and that prospective students were influenced by the results of such contests. A most timely exposure of this fallacy is made by President Eliot, who, in his annual report showed statistically that, with reference to Harvard and Yale, "it is impossible to trace any clear influence of success or failure in athletic sports on the comparative resort to these two colleges as this resort appears in their respective freshman classes." President Eliot concludes: "If the American colleges and universities could satisfy themselves that success in athletics is not indispensable to college growth, or better still, be persuaded that too much attention to athletic sports, or a bad tone in regard to them, hinders college growth, there would probably result a great improvement in the spirit in which intercollegiate contests are conducted; they would come to be regarded as the by-play they really are, and would be carried on in a sportsmanlike way as interesting and profitable amusements."

Gifts During the Year.—Perhaps the most remarkable feature of the educational activities of 1901 was the unprecedented sum of the gifts for furthering education and general culture. During 1901 such gifts that were made in sums of \$5,000 or more amounted to \$107,000,000. The year previous to this showing the largest total gift was 1899, when a total of \$62,000,000 was reached. The combined amount contributed during the past nine years exceeds \$420,000,000. The total of \$107,000,000 for the year includes the gifts of Mr. Carnegie for libraries, amounting to about \$14,000,000, distributed among 153 places in 33 States, Porto Rico, and Canada. More than \$5,000,000 was the one gift to New York City. The year was also notable for the largest single gift ever made to an educational institution, that of \$30,000,000 to the Leland Stanford, Junior, University, by Mrs. Jane Stanford. This sum included \$18,000,000 in moneys and bonds and \$12,000,000 in real estate, the latter property being a retransfer of gifts previously made. The legality of previous gifts having been questioned, a constitutional amendment was passed legalizing the transfer. Mr. Jonas Clark bequeathed \$2,500,000 to the university which bears his name. Mr. John D. Rockefeller gave during the year \$1,250,000 to the University of Chicago, \$150,000 to Wellesley College, \$250,000 to Brown University, \$250,000 to Cornell University, \$230,000 to Bryn Mawr College, \$200,000 to Barnard College, \$200,000 to Oberlin College, \$110,000 to Vassar College, \$200,000 to the Institute for Medical Research, together with a large number of smaller gifts. Mrs. Emmons Blaine added \$1,000,000 to her gifts to the University of Chicago. Mr. J. Pierpont Morgan contributed \$1,000,000 to the Medical School of Harvard University; Mr. and Mrs. Everett Macy \$500,000 to Teachers College; and Mr. D. K. Pearsons, \$200,000 to Beloit College. Johns Hopkins University received gifts amounting to more than \$900,000; Armour Institute, \$1,200,000; Brown University, more than \$1,000,000; the University of Chicago, \$400,000, in addition to the gifts from Mr. Rockefeller and Mrs. Blaine; Syracuse University, more than \$500,000; Tulane University, more than \$1,500,000; and Yale more than \$500,000. Scarcely an institution in the country has failed of some benefaction, and several new institutions have been founded with endowments of hundreds of thousands, or even millions. More than 150 donors can be enumerated whose benefactions are in amounts above ten thousand, and there are very many more whose names are withheld or not known.

Statistics.—The number of institutions for higher education fell off during the year 1899-1900 from 484 to 480, the decrease being in the colleges for men, while the number of co-educational institutions and colleges for women remained the same, i.e., 344. The total number of students in both private and public institutions was 110,912, including 37,898 female students, and showing an increase of 6,743 students over the preceding year. The number of students in the institutions for higher education for every million inhabitants was 1,913 in 1899-1900, 1,763 in 1894-95, and 1,327 in 1889-90. A comparison of the number of undergraduates and resident graduate students in all the institutions for higher education in the United States in 1899-1900 and in 1889-90, shows that the number of male students increased during the decade from 44,926 to 72,159, or 60.6 per cent., while the female students increased during the same period from 10,761 to 26,764, or 148.7 per cent. The total value of the property owned by all the higher institutions of the United States in 1899-1900, was \$360,594,595, showing an increase of \$17,706,234 over the preceding year and including \$166,193,529 of endowment funds. The total income for the year amounted to \$28,558,403, of which tuition and other fees amounted to \$11,171,127, or only 39 per cent.

COLLEGES, UNIVERSITIES, AND SCHOOLS OF TECHNOLOGY IN 1900.

	Total Number of Institutions.	Attendance.		Public Institutions.		Private Institutions.		Income.*	Benefactions.*
		Male.	Female.	Male.	Female.	Male.	Female.		
Maine	4	307	16	540	216			\$231,624	\$56,537
New Hampshire	2	119	9	651	...			114,350	350,000
Vermont	3	234	49	146	56			111,327	143,320
Massachusetts	9	1,300	55	4,617	3,347			2,534,241	1,287,220
Rhode Island	1	58	26	685	183			176,924	151,815
Connecticut	3	48	27	2,372	106			911,573	782,182
New York	23	1,368	...	5,716	2,411			3,456,058	1,814,217
New Jersey	5	195	10	1,773	6			359,939	235,753
Pennsylvania	35	1,658	8	4,696	1,881			1,794,043	838,564
<i>North Atlantic Division..</i>	<i>85</i>	<i>5,287</i>	<i>200</i>	<i>21,196</i>	<i>8,206</i>			<i>\$9,690,079</i>	<i>\$5,659,608</i>
Delaware	2	98	8	...	...			\$49,628	.....
Maryland	11	374	...	989	738			451,606	\$60,000
District of Columbia	7	84	39	587	120			421,477	72,802
Virginia	11	1,044	...	830	945			346,274	81,931

COLLEGES, UNIVERSITIES, AND SCHOOLS OF TECHNOLOGY IN 1900.

	Total Number of Institutions.	Attendance.		Private Institutions.		Income.*	Benefactions.*
		Public Institutions.		Male.	Female.		
		Male.	Female.	Male.	Female.		
West Virginia	3	208	113	40	120	\$171,949	\$50,000
North Carolina	15	697	15	1,119	1,028	209,238	88,473
South Carolina	9	666	21	583	1,115	107,010	48,100
Georgia	11	698	18	735	1,994	135,567	78,383
Florida	5	77	54	65	39	72,176	17,308
<i>South Atlantic Division..</i>	<i>74</i>	<i>3,946</i>	<i>268</i>	<i>4,948</i>	<i>5,599</i>	<i>\$1,964,925</i>	<i>\$496,997</i>
Kentucky	13	260	55	950	1,009	\$278,679	\$135,524
Tennessee	24	274	95	1,535	1,901	560,267	281,706
Alabama	9	525	33	649	845	109,077	8,500
Mississippi	4	467	46	329	1,265	100,325	1,000
Louisiana	8	234	...	513	379	251,914	14,900
Texas	16	773	184	838	733	358,752	96,660
Arkansas	8	205	87	253	285	127,775	19,548
Oklahoma	1	169	103	...	...	20,200	.....
Indian Territory.....	2	...	...	16	17	11,144	8,990
<i>South Central Division..</i>	<i>85</i>	<i>2,907</i>	<i>603</i>	<i>5,083</i>	<i>6,434</i>	<i>\$1,818,133</i>	<i>\$566,828</i>
Ohio	34	1,304	652	2,475	1,626	\$1,237,638	\$645,994
Indiana	13	1,406	365	1,637	434	382,748	61,475
Illinois	31	680	290	3,749	2,610	1,856,846	1,931,735
Michigan	9	1,528	742	581	367	692,690	284,087
Wisconsin	10	1,482	415	642	231	480,524	52,192
Minnesota	9	842	585	566	271	464,100	49,214
Iowa	25	1,108	365	1,290	807	509,456	258,049
Missouri	26	723	198	1,366	1,529	585,741	311,052
North Dakota	3	235	49	18	16	53,874	24,000
South Dakota	5	312	131	85	45	65,338	95,779
Nebraska	10	664	555	313	217	341,566	47,013
Kansas	20	1,131	601	702	489	387,885	117,111
<i>North Central Division..</i>	<i>195</i>	<i>11,415</i>	<i>4,948</i>	<i>13,424</i>	<i>8,642</i>	<i>\$7,118,406</i>	<i>\$3,877,701</i>
Montana	2	67	56	8	2	\$41,232	.....
Wyoming	1	37	36	...	...	55,773	.....
Colorado	4	592	226	305	272	160,049	\$233,020
New Mexico	1	49	23	...	...	11,435	13,500
Arizona	1	34	23	...	...	52,295	.....
Utah	4	106	79	15	5	96,754	4,184
Nevada	1	98	89	...	...	57,110	.....
Idaho	1	59	47	...	...	50,200	100
Washington	7	328	172	180	20	119,990	227,690
Oregon	7	290	188	152	123	82,878	28,208
California	12	1,085	919	1,403	718	858,612	56,600
<i>Western Division.....</i>	<i>41</i>	<i>2,745</i>	<i>1,858</i>	<i>2,063</i>	<i>1,140</i>	<i>\$1,586,328</i>	<i>\$563,302</i>
United States.....	480	26,300	7,877	46,714	30,021	\$22,177,871	\$11,164,436

*Excluding schools of technology and some colleges for women.

The enrollment at the most largely attended universities of the country in the fall of 1901 has been compiled as follows: (1) Harvard, 5,576; (2) Columbia, 4,422; (3) Michigan, 3,816; (4) Chicago, 3,727; (5) California, 3,540; (6) Minnesota, 3,536 (7) Cornell, 3,216; (8) Wisconsin, 2,812; (9) Yale, 2,680; (10) Pennsylvania, 2,520. See EDUCATION IN THE UNITED STATES; PROFESSIONAL SCHOOLS; and articles on various universities and colleges.

URUGUAY, the smallest republic of South America, lies on the Atlantic coast between Brazil and Argentina. The capital is Montevideo.

Area and Population.—The estimated area of Uruguay is 72,210 square miles, and the population, based on the census of 1900, about 900,000. Foreign inhabitants number about 90,000, of whom 24,000 are Italians and 23,000 Spaniards. The estimated population of Montevideo is about 266,000. In 1900 the immigrants numbered 8,892 and the emigrants 6,705. The state religion is Roman Catholicism. In 1899 there were enrolled in the 563 public primary schools 51,663 pupils. In the spring of 1901 the government prohibited the immigration of Jesuits and other clericals.

Government.—The chief executive is a president, while the legislative power devolves upon a congress of two houses, the senate and the chamber of deputies. The president for the four-year term ending in 1903 is Señor Juan Lindolfo Cuestas. The regular army comprises about 3,500 officers and men. The navy is inconsiderable.

Finance.—The monetary standard is gold, and the unit of value the peso, worth \$1.034 in United States money. The principal source of revenue is customs, mainly import, and the largest item of expenditure is interest on the public debt. The total revenue from customs in 1899 was 10,004,425 pesos, and in 1900 9,443,268 pesos. The estimated revenue and expenditure for the fiscal year 1901 balanced at 16,124,000 pesos. On January 1, 1901, the public debt amounted to 125,506,943 pesos, consisting of the internal debt of 22,189,498 pesos, the external debt of 99,660,680 pesos, and the international debt of 3,656,775 pesos.

Industries and Commerce.—The raising of sheep and cattle is the most important industry. The most valuable agricultural crop is wheat, the production of which in 1900 was 6,891,397 bushels; in 1901 there was a serious falling off, the production amounting to about 3,665,000 bushels. The maize crop for 1901 was estimated at nearly 8,000,000 bushels. Imports and exports in 1899 amounted to 25,551,788 pesos and 36,574,164 pesos respectively. In 1900, imports 23,977,606 pesos and exports 29,388,187 pesos. In the latter year the chief imports were:—Raw materials and machinery, 7,259,180 pesos; provisions, cereals, and spices, 4,952,677 pesos; textiles, 4,301,783 pesos; and alcoholic liquors, 2,363,567 pesos. The most important class of exports is pastoral produce, valued in 1900 at 27,139,878 pesos. Agricultural products ranked next with 1,669,923 pesos. For the first six months of 1901 the imports and exports amounted to 12,509,331 pesos and 17,782,249 pesos respectively. Great Britain stands first in both the import and export trade.

Communications.—There are some 5,350 miles of national and departmental roads, 685 miles of maritime and fluvial coast, and several hundred miles of navigable affluents of the Uruguay River. In 1899 the length of the railways in operation was 1,605 kilometres (997 miles). There are over 4,500 miles of telegraph lines. The improvements in the port of Montevideo, authorized in November, 1899, to be effected at a cost of not more than 12,500,000 pesos, were undertaken early in 1901 by a French syndicate under a bid of 9,916,336 pesos. Preliminary work was begun in July.

A Latin-American scientific congress convened at Montevideo on March 20, 1901. The results of the general election of November 24, 1901, showed little change in the composition of the chamber of deputies.

UTAH, a western State of the United States, has an area of 84,970 square miles. The capital is Salt Lake City. Utah was organized as a Territory, September 9, 1850, and admitted as a State, January 4, 1896. The population in 1900 was 276,749, while in June, 1901, as estimated by the government actuary, it was 283,000. Salt Lake City is the largest city, with a population in 1900 of 53,531.

Finances.—The balance in the State treasury on December 31, 1900, was \$211,844.19. The receipts for the following calendar year were \$816,851.41, and the expenditures \$785,594.90, leaving a balance in the treasury of \$243,100.70. Of the receipts, \$100,000 was raised by temporary loan; this, however, was repaid. The State debt at the end of the year was \$900,000, all of which was bonded. This amount was the bonded debt assumed January 1, 1896, from the Territorial government, and which has not since been increased or reduced. The State tax for the year was 8 mills, of which 5 mills were for State purposes and 3 mills for State schools. The total value of State property returned for taxation was \$112,590,763.

Industries.—While Utah is primarily a mining and agricultural State, the census reports of 1900 show a steady increase in manufacturing interests since 1850. In that time the population increased from 11,380 to 274,952, or 2,316 per cent., while the average number of industrial wage-earners rose from 57 to 6,615, embracing in 1900 2.4 per cent. of the total population. In 1900 the amount of actual capital invested in mechanical industries, exclusive of capital stock, was \$14,650,948; the gross value of the products was \$21,299,500, while the net value, exclusive of products re-used in the process of manufacture, was \$17,244,933. The smelting and refining of lead ore is the most important industry of the State, the lead mined being 13 per cent. of the total production of the United States. The manufacture of salt from the concentrated brine of Great Salt Lake is a valuable industry, the product in 1900 being worth \$139,488. Dependent upon agriculture and horticulture are flour and grist milling, with a product valued in 1900 at \$1,829,840; the canning of fruits and vegetables, to the value of \$300,349; the manufacture of beet sugar, to the value of \$1,037,355; of malt liquors to the value of \$432,835, and of butter and cheese valued at \$713,889. Other large industries show value of products as follows: Construction and repair shops of steam railroads, \$1,306,591; foundries and machine shops, \$217,392; manufacture of boots and shoes, \$225,986; and lumber and timber products, \$214,187.

Legislation.—Among acts passed by the legislature in 1901 were the following: A prior law, providing that no person or corporation should be indebted to a banking corporation for more than 15 per cent. of the bank's paid-up capital stock, was amended by providing that no single person should be indebted to a bank for more than 15 per cent. of its capital and surplus combined. An act making compulsory vaccination unlawful under all circumstances was passed over the governor's veto. Acts were passed making it a misdemeanor for any contractor or foreman engaged on public works to contract with or permit his employees to work more than 8 hours a day, and making it also a misdemeanor for any person to coerce or intimidate employees into boarding at a particular house or trading at a particular "company store." A State bureau of statistics was created, whose duty it should be to collect and systematize statistical details relating to agricultural, mining, manufacturing, and other industries of the State, and to present an annual report thereon. The commission appointed was promptly organized and issued a report covering the year 1901. A State board of labor conciliation and arbitration was appointed, to consist of three members, one of whom should be an employee, another an employer, and the third neither an employer nor an employee. In case of a threatened strike, the board was directed to invite both sides to the controversy to present the facts of the dispute in writing, together with an agreement to abide by the decision of the board, and the board was then directed to arbitrate the difficulty.

Pro-Polygamy Bill Veto.—On March 14, 1901, Governor Heber M. Wells vetoed a bill passed by the legislature regulating prosecutions for polygamy, and placing great obstructions in the way of such prosecutions. In his veto message, Governor Wells said that if he were to approve the bill there would at once be a general demand upon Congress for a constitutional amendment "directed against certain social conditions" in Utah, and this demand, in the opinion of the governor, "would surely be complied with." "I yield to no one," the governor added, "in affection for those, my people, who, from the highest motives, and because they believed it a divine command, entered into the relations of plural marriage;" but "I am forced to believe that this bill holds out only a false hope of protection, and that in offering a phantom of relief to a few, it in reality invites a deluge of discord and disaster upon all."

State Officers.—Governor, Heber M. Wells, Republican, term four years, ending January 7, 1905; secretary of state, James T. Hammond; treasurer, John De Grey Dixon; auditor, C. S. Tingley; attorney-general, M. A. Breeden; superintendent of education, A. C. Nelson. Supreme Court—Chief justice, J. A. Miner, Republican; associate justices, George W. Bartch, Republican, and R. N. Baskin, Democrat.

Congressional Representatives (57th Congress).—In the House—George Southland, Republican, from Salt Lake City, elected at large. In the Senate—Joseph L. Rawlins (until 1903), Democrat, from Salt Lake City, and Thomas Kearns (until 1905), Republican, from Salt Lake City.

VACCINATION. See SMALLPOX AND VACCINATION.

VANDERBILT UNIVERSITY, Nashville, Tenn., founded 1873, through a gift of \$500,000 by Cornelius Vanderbilt, had during the academic year 1900-01 a faculty of 103 professors and instructors and a student-body of 754, distributed as follows: Academic, 210; engineering, 40; biblical, 79; law, 55; medical, 219; pharmaceutical, 61; dental, 123. The total receipts of all departments from all sources during the year amounted to \$137,749. The library contains about 33,000 volumes. The summer school for 1901 had 60 students, representing 12 States.

VANT' HOFF, JACOBUS HENRICUS, honorary professor of chemistry at the University of Berlin, received the Nobel Prize (*q.v.*) in chemistry in 1901. He was born at Rotterdam, Holland, August 30, 1852. In 1896 he accepted his present position at Berlin, where he continued, under government patronage, his chemical experimentation. His work in molecular physics has been of the greatest importance, and he is regarded as the founder of a new system of stereo-chemistry. Since 1885 he has, with Ostwald, edited the *Zeitschrift für physikalische Chemie*, and he has published the following volumes: *La Chimie dans l'espace* (1875); *Ansichten über die organische Chemie* (1878); *Etudes de dynamique chimique* (1884); *Lois de l'équilibre chimique* (1885); and *Dix années dans l'histoire d'une théorie* (1875).

VAN VLIET, General STEWART, major-general, U. S. V., died at Washington, D. C., March 28, 1901. He was born at Ferrisburg, Vt., January 21, 1815, and graduated at the United States Military Academy in 1840. He served actively against the Seminoles, 1841-42, through the Mexican War, in the final campaign against the Sioux, 1855, and when the Civil War broke out was promoted to major and shortly afterward brigadier-general of volunteers. From August, 1861, to July, 1862, he was chief quartermaster of the Army of the Potomac, and remained in that department of the regular service until he was retired in 1881 with the rank of colonel and assistant quartermaster-general. For faithful and distinguished services he was brevetted on four occasions, finally attaining the rank of major-general of volunteers.

VARIATION. See BIOLOGY.

VASSAR COLLEGE, for women, Poughkeepsie, N. Y., was founded in 1861 as Vassar Female College, but in 1867 received its present name. During the year 1900-01 the faculty consisted of 23 professors and 45 instructors. The student-body numbered 799, as against 700 for the previous year. Of the total number, 10 were graduate students, and 12 special students, leaving 777 in the four classes. During 1901, extra accommodations were provided for students, by the erection of a new dormitory and Mr. John D. Rockefeller contributed \$110,000 for a similar building. The library contains over 40,000 volumes, and last year received a fund of \$10,000 from the alumnae.

VENEZUELA, a South American republic bordering the Caribbean Sea between Colombia and British Guiana. The capital is Carácas.

Area and Population.—The area of the 20 states comprising Venezuela is estimated at about 535,000 square miles. The estimated population in 1894 was 2,444,816, of whom over 325,000 were Indians. The state religion is Roman Catholicism. Primary instruction is free and nominally compulsory. There are about 1,450 national and 150 state primary schools, and a number of institutions for secondary and higher education.

Government and Finance.—The chief executive is a president, who is assisted by a cabinet and a federal council. The legislative power devolves upon a congress of two houses, the senate and the house of representatives. Since the overthrow of the Andrade government in October, 1899, the president has been General Cipriano Castro, who represents the Liberal party. The monetary standard is gold and the unit of value is the bolivar, worth one franc, or 19.3 cents in United States money. The most important source of revenue is customs. The estimated revenue and expenditure for the fiscal year 1900 balanced at 38,877,480 bolivars and for 1902 at 37,000,000 bolivars. According to a Belgian report on foreign securities, the debt of Venezuela on January 1, 1901, was: Foreign, 73,772,237 bolivars; internal, 131,154,183 bolivars; extra, 23,000,000 bolivars; total, 227,926,420 bolivars (\$43,989,800). This amount by May 1, 1901, had been reduced to 220,000,000 bolivars (\$42,460,000).

Industries, Commerce, etc.—The principal industries are agriculture and cattle-raising. The mineral resources are considerable, but mining is not highly developed. The principal crop is coffee, Venezuela ranking next to Brazil among the coffee-producing countries of the world. Other important products are cacao, sugar, cereals, and rubber. The asphalt industry is important in the state of Bermudez and pearl-fishing round the island of Margarita. The production of gold in the Yuruari district in 1896 amounted to 60,674 ounces, and in 1899 42,315 ounces. The total imports and exports in 1897 were valued at 68,714,250 bolivars and 93,245,000 bolivars respectively; in 1898, 42,797,500 bolivars and 74,497,550 bolivars respectively. The foreign trade is chiefly with the United States, Germany, France, and Great Britain. The principal imports are provisions, textiles, hardware, coal, petroleum, and machinery. In 1899 the coffee exported from the chief ports of the republic amounted to 40,931,233 kilogrammes; cacao, 5,818,784 kilogrammes; hides, 2,956,285 kilogrammes. In 1899 there were 529 miles of railway in operation.

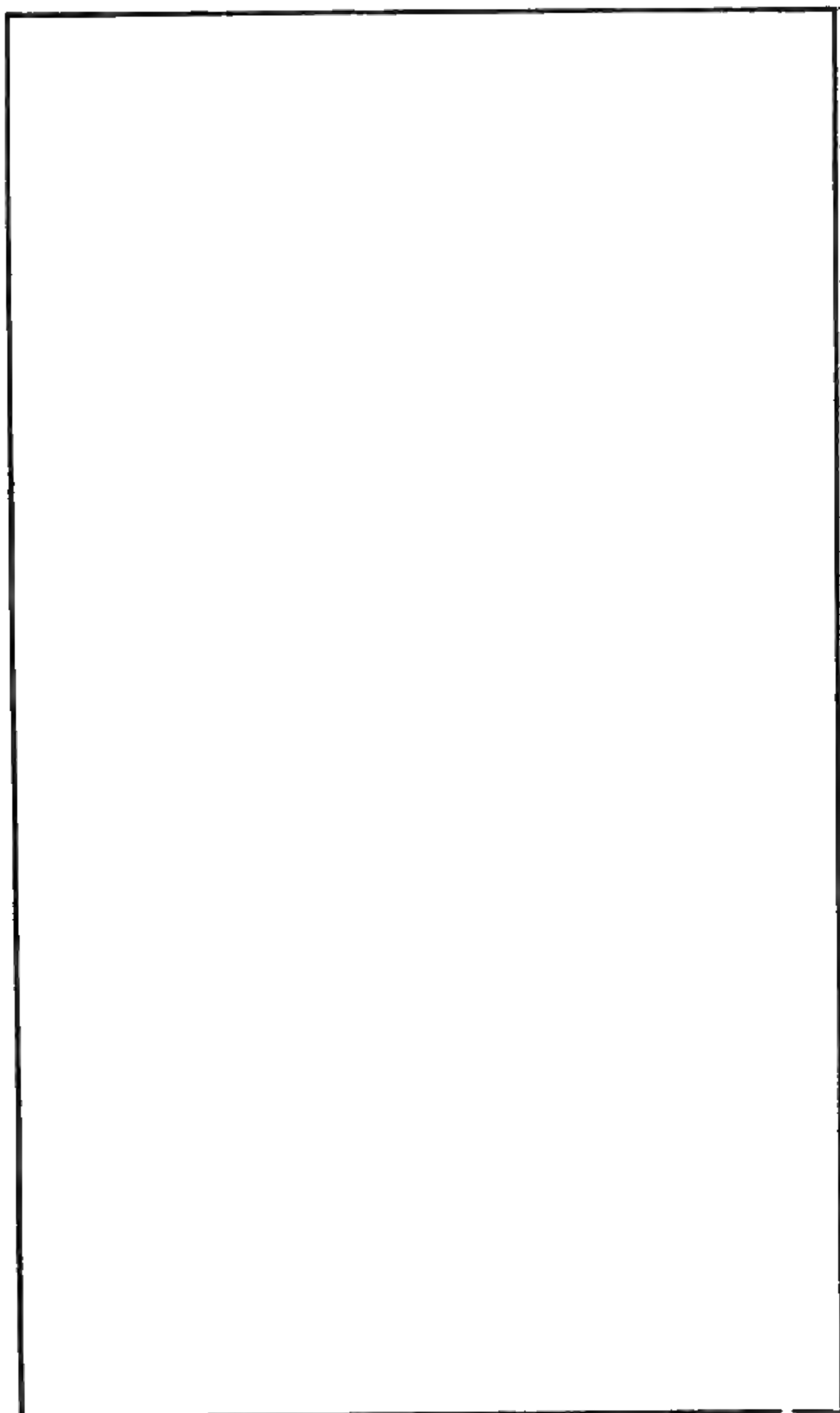
HISTORY.

Political Unrest.—The history of Venezuela for 1901 is one long calendar of revolt, political conspiracy, and international embroilment. Early in the year several spasmodic revolts against the autocratic rule of President Castro occurred. One of these led by General Porazo, one of ex-President Andrade's generals who had deserted to Castro and helped the latter to expel Andrade from the country, resulted in the defeat of the rebels, who with their leader were driven over the Colombian border. At the same time a vigorous rebellion occurred in eastern Venezuela, which was suppressed only after several severe engagements. In March, Castro, who had been acting president of Venezuela since he overthrew President Andrade in October, 1899, was formally elected president by the Venezuelan Congress to fill the unexpired term. With the renewal of the Liberal revolt in Colombia, the disorder in western Venezuela along the Colombia border increased, and during the last six months of the year war seemed on the point of breaking out at any moment. (See COLOMBIA, paragraph Civil War and the Trouble with Venezuela.) There was more or less actual fighting between Colombian and Venezuelan forces, and the attitude of Castro's government appeared at one time so threatening as to draw a warning note from the State Department of the United States. In November and December the revolutionary movement in Venezuela increased rapidly under the leadership of Señor Matos, and President Castro's position became more difficult. Disputes with Germany over unpaid claims, with France over the confiscation of the estates of a French subject, M. Secrestat, and with the United States over the arrest of Consular-Agent Baiz at Barcelona, remained unsettled, and altogether the international as well as the internal affairs of the republic seemed to be in an unhappy condition.

The German Claims.—Aside from the trouble with Colombia, the most important of Venezuela's international complications during 1901 consisted of a dispute with Germany, arising from the demand of the latter country for the settlement of various claims due German subjects. The claims consisted of three classes: Demands for damages suffered during the civil wars of the past three years; unpaid claims of long standing due German merchants; and arrears of interest on a 5 per cent. loan of 50,000,000 francs placed in 1896 with German, English, and French capitalists, for railway building. The *República*, a newspaper of Carácas, said to be the personal organ of President Castro, declared that Venezuela would resist to the utmost the payment of the last claim, holding that since the debt was contracted with private individuals it should be settled in the civil courts. From various unofficial sources it was announced that Germany would attempt to seize one or more Venezuelan ports to enforce or insure the payment. As a result of an inquiry on the part of the United States, in a note from Secretary Hay addressed to the German ambassador, as to what Germany's intentions were, with a view to discovering whether the proposed seizure would be a violation of the Monroe Doctrine, Germany gave assurance that no territorial encroachment was intended, it being understood that her policy would be to hold the seized ports only until settlement should have been made or customs duties sufficient to satisfy the claims should have been collected.

The Asphalt Dispute.—The dispute begun in 1900 between the New York and Bermudez Company, and the Warner-Quinlan Syndicate, two American companies holding asphalt concessions in Venezuela, continued throughout 1901 and at the end of the year remained unsettled. In December, 1900, the New York and Bermudez Company, which held the prior concession, appealed to the State Department at Washington, declaring that President Castro was intending to expel them by force of arms from territory which they had possessed for twelve years, and turn their property over to the syndicate which had secured their concession by contributing to the fund that made the success of Castro's revolution of 1899 possible. In pursuance of instructions from Washington, the American minister, Mr. Francis B. Loomis, expostulated with President Castro, and the United States gunboat *Scorpion* was ordered from La Guayra to the scene of the disturbance. In January, 1901, upon Castro's assuring Minister Loomis that he did not intend to use force, but would allow the courts to settle the dispute, the orders to the *Scorpion* were revoked. At the close of March, Minister Loomis, who had been made the object of vicious attacks by the pro-Castro press in Venezuela, was recalled to Washington for a conference, and in May it was decided that although the State Department upheld him in his attitude, it were best to relieve him of his diplomatic duties at Carácas. He was transferred to Persia and Mr. Herbert W. Bowen, the United States minister to Persia, succeeded him in Venezuela. Meanwhile the asphalt dispute had been taken into the Venezuelan civil courts, and in May, the high federal court rendered a decision declaring its competency to pass upon the dispute, which declaration was considered a victory for the Warner-Quinlan Syndicate, the New York-Bermudez Company having protested against the court's assuming jurisdiction on the ground that its decision had been "fixed" in advance by agreement between Castro and the Warner-Quinlan Company. Toward the close of 1901 it was announced that negotiations were in progress between the rival companies looking toward a compromise, but up to the end of December nothing had been accomplished nor had any decision of the disputed points been rendered by the supreme court at Carácas.

VERDI, GIUSEPPE FORTUNINO FRANCESCO, Italian composer, died at Milan, January 27, 1901. He was born at Roncole, near Busseto, October 9, 1813, and was educated in music at Milan under Lavigna (1833-36), after which he returned to his native village to assume the duties of an organist. Beginning with 1839 he produced twenty-eight operas, which may be divided into four groups in accordance with the composer's changes of method. They may be given chronologically with examples: (1) 1839-51, a period of immaturity and imperfection, showing traces of the Bellini-Donizetti style then in vogue, and winning quick applause for the scarce-concealed revolutionary sentiments expressed in the libretti of the productions; *Oberto*, *Conte di San Bonifacio* (1839); *Nabucodonosor* (1842); and *Ernani* (1844). (2) 1851-67, the highest point reached in the old Italian style of composition; *Rigoletto* (1851); *Il Trovatore* and *La Traviata* (1853). (3) 1867-71, a period of rest and deliberate study, finally marking a surrender to changed dramatic conditions; *Aida*, written for the Khedive of Egypt and produced at Cairo (1871). (4) 1871-87, a period of striving for still greater excellence, its result being the firmer establishment of the new and vigorous Italian school introduced by *Aida*, *Otello* (1887). The first part of his second period established Verdi's fame outside of Italy, with *Rigoletto* and *Trovatore*, the production of which immediately became coextensive with opera itself, but it is in his later works, *Aida* and *Otello*, that his greatest technical excellence and dramatic power lie. Dissatisfied with his earlier work, which however lifted him from penury, and by 1855 had bestowed upon him a pecuniary success that might



GIUSEPPE VERDI

Congressional Representatives (57th Congress).—In the House: D. J. Foster, from Burlington; and Kittridge Haskins, from Brattleboro—both Republicans. In the Senate: William P. Dillingham (until 1903), from Waterbury; and Redfield Proctor (until 1905), from Proctor—both Republicans.

VICTORIA, a state of the Commonwealth of Australia, with an area of 87,884 square miles. The population, according to the census of 1901, was 1,195,874, as against 1,140,405 in 1891, showing an increase of less than 5 per cent. for the decade, as compared with over 32 per cent. for the preceding decade. The capital is Melbourne, with a population (including suburbs) of 493,956 in 1901. Instruction is mostly secular and compulsory. The number of state schools in 1899 was 1,892, with a total enrollment of 239,732, and of private primary schools about 950, with an attendance of over 44,000.

Government and Finance.—The executive authority is vested in a governor appointed by the crown and assisted by a ministry of 10 members, and the legislative power devolves upon a council and an assembly. The revenue for 1901 amounted to £8,087,265, of which £360,102 was retained by the central government. Among the items of expenditure were old-age pensions to the amount of £225,000. The budget for 1902 gives the revenue as £6,963,200 and the expenditure as £7,192,313. The public debt on June 30, 1900, amounted to £48,774,885.

Industries, Commerce, etc.—The total area under cultivation in 1901 was 3,924,898 acres, of which over 2,000,000 acres were under oats. The principal crops for 1900 were: Wheat, over 15,000,000 bushels; oats, over 6,000,000 bushels; and barley, about 1,500,000 bushels. The live stock comprised in 1899-1900 over 12,000,000 sheep and over 465,000 milch cows. The gold output for 1900 amounted to 807,407 ounces, and the other minerals produced during the year had an estimated value of £5,206,154. The exports in 1900 amounted to £17,422,552 (£18,569,780 in 1899), and consisted chiefly of wool, £4,217,018; butter, £1,489,935; wheat, flour, and biscuit, £1,151,629; and live stock, £705,619. The imports in 1900 amounted to £18,301,811 (£17,952,894 in 1899). The imports from Great Britain amounted to £5,680,415, and the exports to Great Britain £7,338,491. The railway lines, which are all owned by the government, had at the end of 1900 a total length of 3,218 miles. The capital cost of the lines up to the end of the fiscal year 1900 was £39,658,819, and the net revenue for that year £1,217,861. The telegraph lines had in 1900 a total length of 6,772 miles.

History.—Victoria, which with the possible exception of New South Wales and New Zealand, has carried socialistic legislation to a greater extreme than any other Australasian state, experienced considerable difficulty with two of its experiments during 1901. Early in the year it was discovered that the Factories Act, which provided wages boards for the hearing of labor disputes, was increasing instead of diminishing the number of the unemployed and intensifying the existing feeling of hostility between laborers and employers. In July it became evident that the Old-Age Pension Act, which Sir George Turner had rushed through the Victoria parliament in the closing days of December, 1900, and which had gone into effect on January 1, 1901, was being abused to such an extent to affect seriously the finances of the state. Even the framers of the Factories Act were forced to acknowledge that it had not worked completely to their satisfaction, and it was universally recognized that the inherent difficulties in its enforcement would be enormously augmented when federation should become complete and all tariff and trade barriers between the several states be removed. A high tariff was the indispensable accompaniment of such a law, and inter-state free trade would mean either that Victoria's industries must meet competition with destructive effect, or that a federal act must provide all states alike with wages boards and compulsory holidays. The act has established in Victoria what one of its critics has called "industrial militarism." The wages boards, being largely selected and controlled by the labor unions, have been generally partial to the laborer, and, in industries where the margin of profits is narrow, the system has been fatal. Thus it has practically closed every tannery in Victoria. In defense of the act its supporters hold that an industry that cannot afford to pay a fair wage ought not to exist. The law was intended to increase employment, but as far as old men and boys are concerned it has increased the number of the unemployed. It was intended to abolish "sweating," but it really increases it by driving out of the factories men who cannot earn the minimum wage and by causing an increase in individual and house labor, in which the hours are longer and the pay smaller. The system practically enables employees to determine their own wages, and gives them the advantages of partnership, without the risks, in the industry in which they labor. On the other hand, as a result of the wages boards it is estimated that in six trades alone the volume of wages paid has increased by £123,450. The act, however, will expire on May 1, 1902, and in view of federal legislation on the same subject it is not likely to be reenacted.

The Old-Age Pension Act, which went into effect on January 1, 1901, was a legacy of the premiership of Sir George Turner, who resigned to accept the portfolio of

finance in the first federal ministry, and was succeeded on January 19, by Hon. A. J. Peacock, as premier. Sir George Turner had estimated that there would be 6,000 applicants for pensions the first year, and the expenditure for the first six months would be approximately £75,000. But, as Mr. Peacock admitted in laying the matter before parliament in July, 1901, this was a "remarkable example of mistaken calculations," for both the number of pensioners and the expenditure were nearly double the original estimates. The defects in the act were the size of the pension—10s. a week instead of 7s., as in New Zealand—and the ease and secrecy with which pensions were allowed, which led many to accept aid who would not have done so had there been more publicity in the matter. Mr. Peacock asked parliament to reduce the amount from 10s. to 7s., declaring that the state could not afford to expend £300,000 a year for pensions. There was opposition to the reduction, while the ministry threatened to resign if the change were not made. On November 7 the ministry was defeated in the assembly by one vote on the question of reduction, but did not carry out its threat, a compromise being soon after effected at 8s. The law had had the effect of emptying every poorhouse and old-age sanitarium in the state, and had induced a large influx of old people above the age of 65 from other states. The government showed an inability to secure the reforms in the constitution providing, among other things, for the reduction of the size of parliament, which had been outlined as one of its measures at the opening of the session, and in December, 1901, the opposition moved a vote of lack of confidence for "general administrative weakness." The government, however, was sustained, largely, it is said, through the personal popularity of Mr. Peacock, the premier, one of the ablest of the younger statesmen of the Commonwealth. A state colliery and iron rolling-mill is being constructed and will be operated by the government when completed.

VICTORIA, queen of Great Britain and Ireland, and empress of India, died at Osborne House, Isle of Wight, on January 22, 1901. She was born in Kensington Palace, London, May 24, 1819, and was the only child of Edward, Duke of Kent, the fourth son of George III., and Princess Victoria Maria Louisa of Coburg, sister of Prince Leopold, afterward king of the Belgians. At the time of her birth there seemed slight prospect of her ever ascending the throne, for the Duke of York and the Duke of Clarence, older brothers of the Duke of Kent, were still alive, and there were other apparent possibilities of hindrance. But the Duke of Kent died in 1820, the Duke of York, afterward George IV., died without issue in 1830, and as the two daughters of the Duke of Clarence had died in early infancy, Victoria became the heir-apparent when he succeeded his brother as William IV. Deprived by her father's death of the chance of any considerable income, as royal incomes go, the princess was trained in the principles of economy, much as any English girl of ordinary birth might have been. Until her tenth year her entire instruction had been in German, received from a Miss Lehzen, whom George IV. made a baroness of Hanover; but when it seemed probable that Victoria would succeed to the throne, her mother, though thoroughly German at heart and as thoroughly unsympathetic with English politics, nevertheless personally supervised her instruction in the duties devolving upon a queen, and brought her to her majority entirely unhampered by political bias.

On June 21, 1837, Victoria was proclaimed queen. From the time of George I. the king of Great Britain had also been king of Hanover; but since women were excluded from the Hanoverian crown, upon the death of William IV., his brother, the Duke of Cumberland, became king of that state—a division of rule that was much relished by Englishmen, who had regarded with disfavor this double sovereignty in the fear that their country might be embroiled in the dissensions of the German states. Lord Melbourne was prime minister at the time of Victoria's accession and to his kindly instruction in the intricacies of court and government procedure was due the affection the queen ever afterward displayed toward him. Her reign opened inauspiciously. The winter of 1837-38 was one of unusual distress and poverty for the working people, and the supposed ascendancy of a frivolous and aristocratic minister over the queen's mind gave an edge to their sufferings and complaints. The Chartist movement, dating from 1832, owed its great strength to this feeling of discontent. A conference between six members of the House of Commons and representatives from the Workingmen's Association was held in 1838, and what was called *The People's Charter* was formulated. The specific reforms it demanded were: (1) Annual parliaments; (2) universal suffrage; (3) voting by written ballot; (4) the removal of property qualifications for a seat in Parliament; (5) salaries for members of Parliament; and (6) the reapportionment of electoral districts according to population. Riotous demonstrations were frequent and menaced the safety of the state. In the fall of 1837 an insurrection broke out in Canada, and the Earl of Durham, a Whig, appointed for its suppression, tendered his resignation in a letter expressing his impotence to execute his commission and attacking the government. The year 1838 also saw the beginning of active agitation for the repeal

of the laws imposing a duty on the importation of grain and the founding for this purpose of the Anti-Corn Law League. The "Bedchamber Plot" came before the public attention in 1839. The Whig ministry having resigned as the result of a virtual defeat in Parliament, Sir Robert Peel, a Tory, was asked to form a cabinet. His conditional consent stipulated that the mistress of the robes and the ladies of the bedchamber who held their places by Whig appointment, be removed. This the queen, acting under the advice of Melbourne, flatly refused to allow, and by so doing added to the demonstrations of disloyalty then prevalent. It was undoubtedly a mistake, for some of the members of the household were related to some of Peel's most eager political enemies, and he could not be expected to assume the premiership under such conditions.

This existence of public discontent and the consequently waning prestige of the Whigs, with whose principles her sympathies were known to lie, coming as they did at the very outset of her reign, were the cause of great solicitude and worry on the part of the queen. Her coronation (1838) had been the occasion for a display of loyalty such as is rare even at ceremonies of that nature. Yet, within two years, the popular sentiment had become one of distrust, not so much of the sovereign, as of her advisers. The queen heard the accusation that the court was dominated by her mother, and saw the growing aversion of her ministers to the duchess, a state of affairs that hastened her marriage. Albert, son of Ernest, Duke of Saxe-Coburg-Gotha, a cousin of the queen, and of about the same age (born August 26, 1819), had been brought to England to visit the Princess Victoria in 1836, and although there were numerous other seekers for her hand, it was understood from that time that she favored his suit. When she convened Parliament in January, 1840, she announced her intention to marry Albert, and the wedding took place on February 10 in the chapel of St. James's Palace. The prince consort by his union with the queen of England stepped at once into a difficult position in the nation. When the betrothal was announced the inherent English aversion to German nobility found ready expression, and the prevalent suspicion that this particular noble was a Roman Catholic was not allayed as it might have been by a positive statement to the contrary. In this the Established Church saw its supremacy endangered. The knowledge that the prince had never interested himself in the affairs of his own state, moreover, made it unlikely that he would become thoroughly intimate with British institutions, and this fear chilled the enthusiasm of another portion of the people. The Melbourne ministry had come into disfavor through its halting and obsequious policy. The Tories were steadily gaining strength, and the Duke of Wellington, the people's idol, rising above mere party divisions, opposed the ministry, a fact which alone aroused a questioning attitude concerning all the official and unofficial acts of the government. The popular sentiment thus directed by insufficient and perhaps unjustifiable causes, contrived to sadden what was otherwise the happiest period of the queen's life. It may be said that Albert's worth was never fully known until after his death. While his life as a husband was recognized as faultless and his beneficial influence over the acts of the queen was known to deserve credit, the first prejudices were never entirely removed. Parliament practiced economy in fixing his allowance, and denied him the status of citizenship. Public opinion censured him for not taking active part in affairs of state, yet consistently resented his so-called "interference" with the government. There was always an undertone of dissent in the popular regard for him, and the considerable service he rendered to English science and art was temporarily obscured. Another condition that sustained this mixed feeling for the prince, was the presence in London for a part of each year between 1840 and 1856, of Baron Stockmar. From the time when he had first visited England to assist in the arrangement of the details of the royal wedding, he was considered the prince's mentor, so that the saying arose that "the prince ruled the queen and Stockmar ruled the prince."

Immediately after her marriage the queen entered upon the close application to state business that forms a distinguishing feature of her reign. The Melbourne ministry fell in 1841, as a result of its lack of initiative, and Peel came into power. In the remembrance of his activity in the "Bedchamber Plot" and the violent part he had taken in relation to the prince consort's place in public affairs, it was embarrassing both to the queen and to him to meet as sovereign and premier. In his pompous mannerisms, she missed the gracious suavity of Lord Melbourne, but before long a perfectly friendly understanding was established between them. The principal feature of Peel's administration was the continued agitation for the repeal of the Corn Laws. Crop failures in 1845 and the high price of grain rendered critical the condition of the poor, and Peel, responding to their incessant clamor for repeal, suddenly announced his conversion to the side of the Anti-Corn Law League, whose doctrines he had hitherto bitterly opposed. A split in the ministry resulted from this announcement, and Peel resigned. Lord John Russell (Whig), undertook to form a new cabinet, but failed, and Peel resumed office. In June, 1846, his party passed a

bill providing for the gradual abolition of the corn duties, and Peel went out of office execrated for his abandonment of lifelong principles. His surrender, however, allayed in a measure what was becoming a serious danger. Lord Russell, his successor, had to face, at the outset, grave conditions. The Irish famine began in 1846 and reduced the population from 8,000,000 to 6,000,000. A mortality of 1,400 a week, without any evidence of government effort for an amelioration of the conditions, caused a state of popular unrest and murmuring that made the queen and her advisers apprehensive. Demagogues were declaiming to wilful crowds, while bread riots and the sentiment created by the Catholic clergy in manifest opposition to England, so disturbed the public mind that men speculated on the stability of the British throne. Through this period the queen steered an admirable course. Personally desirous of canceling, for economy's sake, all public festivities, she was restrained from this by her premier; but she nevertheless enjoined the most rigid frugality upon her court, and aided in every possible way to assist the condition of the Irish peasantry. Soon affairs began to assume a more hopeful aspect. The year 1848 witnessed a fury of political convulsion on the continent that brought manufactures there to a standstill. Accordingly, the mills and factories of England were working at extra speed. Trade prosperity was in sight, wages were high, the Chartists were killing their own cause by ridiculous extremes, the Corn Law agitation had been settled, and the queen came to be regarded with an enthusiasm bordering on infatuation. The International Exposition of 1851, the project of Prince Albert, consummated by him over great opposition, assisted further in bringing about settled conditions in England and in establishing her leading position in the manufacturing world through the renovation of her methods. In the same year the threatened invasion of the country by the Roman Catholic Church, called the Papal Aggression, which appeared to menace the Church of England, was averted. The pope had announced his intention of dividing the country into sees, and when the plan came to be executed it caused public consternation. Parliament enacted against it extreme prohibitive measures, with which the queen was not in sympathy, believing that the Protestantism of the country could of itself withstand any aggression, and that such legislation savored of religious intolerance. Lord Derby (Liberal) succeeded Lord Russell as premier in 1852, and he in turn was replaced by Lord Aberdeen (Peelite) in the same year. His ministry, which saw the beginning of the Crimean War, was overthrown in 1855 as a result of exposures of military mismanagement. Lord Palmerston (Moderate Liberal) succeeded, and by hurrying together an effective army contrived to bring the nation out of the struggle with credit. During the war, the queen played an active part, personally serving as head of various committees to secure relief for the soldiers and contributing from her private means to the hospital work conducted by Florence Nightingale. This conflict was no sooner over than news of disaffection among the native troops in India was heard. In the summer of 1857 massacres occurred at Lucknow, Cawnpore, and Oudh, and the small number of British troops in the country lent a serious appearance to the situation. With great ability, however, the insurrection was quelled in 1858 and the government of the dependency passed by act of Parliament from the East India Company to the crown.

The friendly relations that had existed between France and England since the time when the queen had personally supplied the fugitive Louis Philippe with funds and had given him and his family a home in England (1848), were severely strained in 1858 after an attempt on the life of Napoleon III. A spirited correspondence between Lord Palmerston and the French minister for foreign affairs, who protested that England was an asylum for conspirators and regicides, and that the plot against Napoleon had been formulated in London, as well as the popular excitement on both sides of the channel, led to a feeling of estrangement between the countries. The queen and her people resented with dignity the imputations of the French, and the ministry was defeated for apparent assent to the demands of France for the exclusion from England of political refugees. Lord Derby then conducted his second administration, which lasted a year and a half, and Palmerston again came into power in June, 1859. This veteran in politics had always been at odds with his sovereign; so much so that in 1852 he had been forced to resign from the foreign office in consequence of somewhat indiscreet letters he had dispatched in the queen's name and because he had refused to submit his correspondence to her. His foreign policy was always prompt and vigorous, and it was said of him that he would never accept a cabinet office without pledges of warlike policy. In 1861, after the outbreak of the Civil War in the United States, the British steamer *Trent* was boarded by Federal officers, who seized and carried off the Confederate commissioners, Mason and Slidell, who were on their way to England. Lord Palmerston peremptorily demanded their release and the United States promptly complied, thereby averting what would have been at least a disagreeable complication. To the queen's intermediary influence between the two countries was afterward given the credit for

smoothing the difficulty. In 1863, when Germany and Austria went to war with Denmark, Palmerston endeavored to oppose them with France as an ally, but upon the refusal of Napoleon III. to consent he changed his plans. From October, 1865, when Palmerston died, until June, 1866, Lord Russell was once more in power, his ministry being replaced again by that of Lord Derby, the real head of which was Benjamin Disraeli, chancellor of the exchequer. Lord Derby resigned in 1868 on account of ill health and Disraeli became premier. In conferring this honor the queen acted directly against her personal inclination and solely in the interest of political justice. For Disraeli she had only aversion, but recognized his leadership of the Conservatives. For a time their relations were somewhat strained. He gave her his best advice, and when she rejected it supported her view with loyalty; but behind this there were evidences of many struggles. His successor, Gladstone (Liberal), came into power late in 1868 through his stand on the Irish Disestablishment question. The queen expressed very definitely her opposition to Gladstone's procedure in bringing up the question, fearing the evil results its prematurity might effect; but, seeing the weight of the support it received, she acquiesced.

The Gladstone ministry remained in power for more than five years and accomplished a number of reforms, chiefly in connection with affairs in Ireland. It introduced the ballot in the general elections, the need of which had become evident since Disraeli's extension of the franchise in 1867. But it tended toward too extensive reforms, and this, combined with a weakness of foreign policy, engendered a Conservative reaction that brought Disraeli back to power in 1874. During his premiership the relations between him and the queen came to be of the most cordial character. He had the power to unify his party, and, better yet, he exercised the greatest tact in dealing with his sovereign, so that dissensions between them were entirely absent from his second administration, and she regarded him with a personal esteem closely akin to that she had shown toward Lord Melbourne. The chief feature of the administration was the revival of the Eastern Question. The Russo-Turkish War of 1877-78 had reached a point where the Russians were ready to enter Constantinople. England sent a fleet to the Bosphorus to protect her interests, and she narrowly averted serious trouble with Russia. Other nations were ready to interfere in the dispute, but the conference of Berlin ended the conflict and England received the island of Cyprus. Gladstone, who had retired from the leadership of his party upon resuming private life, now reentered politics and stirred the country by speeches in behalf of the Bulgarian Christians who had suffered outrage and massacre during the war, and on the strength of the sentiment he aroused came again into power as premier in 1880. For five years he was occupied with affairs in Ireland and a policy in connection with Egypt and the Asiatic dependencies that called forth much criticism. Lord Salisbury was premier for a few weeks in 1885, and then Gladstone returned in January, 1886. He immediately introduced a bill providing for the establishment of an Irish Parliament and thereby caused a defection of his colleagues, who formed the Liberal-Unionist party and contrived his defeat under the leadership of Lord Salisbury, who again became premier.

In 1887 occurred the queen's first jubilee, in celebration of her fifty years of sovereignty. Beginning with June 21, a long series of public festivities took place, at all of which, amid remarkable scenes of splendor, the people's regard for the queen was unmistakably shown. Ireland was comparatively peaceful during this administration. In 1887, Parnell, a supporter of Gladstone's efforts to secure home rule, was tried on the charge of inciting and abetting acts of violence in Ireland, but was exonerated. In 1890, however, in consequence of personal misconduct, he was abandoned by Gladstone, and as a result the two factions of the Irish sympathizers, Parnellites and anti-Parnellites, arose. Gladstone came into his fourth premiership (1892), at the age of 82. As was expected, his chief measure was a second Home Rule Bill, at the presentation of which he delivered a masterly argument. After securing a good majority in the Commons, the bill was effectually disposed of by the Lords, and Gladstone's final attempt brought his cause no nearer success than before. He resigned in 1894 on account of feeble eyesight and retired finally to private life. The history of his relations with the queen is the story of a continuous struggle. His dearest project was home rule for Ireland, a theory that found no advocacy in his sovereign; but on other measures as well their differences in policy were known to all, and it was believed that the queen was never fully at ease with Gladstone in power. Upon his resignation, Lord Rosebery, of the foreign office, became premier, but in 1895 gave way to Salisbury's third administration, which has continued to the present time. The completion of Victoria's sixtieth year as queen was commemorated in 1897 by a celebration that has been described as the most splendid the world ever saw, and there was brought home to the people a sense of the world-wide power and magnificence of their empire. In 1897 and 1898 conflicts in India and Egypt were brought to a victorious end, and in the fall of 1899 the South African

War broke out after threatenings of years. While the queen never had any doubt as to the final outcome of this struggle, its growing cost in blood and money gave her much distress during the close of her reign and her expressed wish to end her rule in time of peace was denied. She died in her eighty-second year after a steady decline of a few months. Up to the last, however, she gave attention to official business and did not discontinue her daily drives until a week before the end.

In her home life Victoria presented to the world a model of excellence. Her love for the prince consort and the bitterness of her grief at his death were unaffectedly told by her acts. She was much disturbed by the reception he received in England and said so, but only in the sense that the indifference of the people was due to lack of acquaintance with his worth. His death in 1861 was followed closely by that of the queen's mother. To Albert's memory Victoria erected splendid memorials, and for fifteen years rarely appeared at public celebrations. She was the mother of nine children. The first was Victoria, born in 1840. She became the wife (1858) of the Crown Prince Frederick of Prussia, afterward emperor, and was known after his death as the Dowager Empress Frederick (*q.v.*). The second child was Albert Edward, born in 1841. He married Princess Alexandra of Denmark in 1863 and upon Victoria's death succeeded to the throne as Edward VII. Princess Alice, the third child, was born in 1843, and in 1862 was married to Prince Louis of Hesse-Darmstadt. She died in 1878. The fourth was Alfred, Duke of Edinburgh. He was born in 1844, married the Grand Duchess Marie Alexandrovna of Russia in 1874, and died in 1900. Princess Helena, the fifth child, was born in 1846 and is the wife of Prince Christian of Schleswig-Holstein, whom she married in 1866. Princess Louise was born in 1848 and was married to the Marquis of Lorne in 1871. Arthur, Duke of Connaught, was born in 1850 and in 1879 married Princess Louise of Hohen-zollern. The eighth child was Leopold, born in 1853. He married Princess Hélène of Waldeck-Pyrmont in 1882 and died in 1884. The youngest child, Princess Beatrice, was born in 1857. In 1885 she was married to Prince Henry of Battenberg, who died in 1896 while serving in the Ashanti War in Africa. The queen attended with great care to the education and training of her children. As to their marriages she imposed no conditions except that the prospective husband or wife must not be a Roman Catholic.

Victoria's reign was the longest in the history of England. In its course stupendous advances in the commercial, political, and social relations of Great Britain took place, all of which had for her a personal concern. Her influence on the history of her country does not plainly appear in actual deeds, as it cannot in the representative form of government. Yet all who have lived in her era, particularly in its latter part, have realized the power of her personality. At different periods, when the people were restive, or a delicate position with another power was at hand, her equable, balanced course of life had its distinctive influence. She knew the function of her premier to be that of adviser, but she never took advice merely as such. Her intimate knowledge of every piece of legislation under debate was maintained until the end, and on every measure she entertained her own judicial opinion, which she abandoned only upon the conviction that her people's good demanded it. She had a residence in Scotland at Balmoral, and usually visited it each year. It was her favorite country, as extracts from her *Journals* amply testify. For Ireland she did not have the same cordial feeling. After Dublin had refused to allow a monument to be erected there in memory of Prince Albert, the queen was deeply grieved. Her visit to Ireland, therefore, in 1900, to commemorate the conduct of "her brave Irish" in the South African War, produced the happiest of effects. Of the personality of Victoria one writer has said: "The character of her Majesty was very widely divined; it cannot with truth be said to have been very precisely known." She was deeply religious in a simple, trustful way, and ordinarily accomplished. Her German accent remained with her until the last and was often remarked with surprise by those who forgot her thoroughly German descent. In her own position in the government, she had always the most perfect faith. She believed that she ruled by divine right, and by her personality no doubt strengthened the loyalty of the people to the throne. The tenderness of the relation between queen and people is perhaps the most impressive feature of her reign. Her flawless character and nobility of mind won the love of the people, and the evidences of sorrow at her death betokened in all her subjects a sense of personal loss.

VIERLING, GEORG, German organist and composer, died at Wiesbaden, Germany, June 4, 1901. He was born at Frankenthal, in the Palatinate, September 5, 1820. After spending the years from 1847 to 1859 in various positions as organist, conductor, and director, he devoted himself to composition. His works include: The secular cantatas *Der Raub der Sabinerinnen*, *Alarichs Tod*, and *Constantin*; the church and orchestra solos *Psalm 137*, *Hero und Leander*, and *Zur Weinlese*; a symphony in C, op. 33; overtures to *The Tempest*, and *Maria Stuart*; and numerous orchestral, violin, and organ pieces.

VIRCHOW, RUDOLF, the world-renowned pathologist, celebrated his eightieth birthday on October 31, 1901. This anniversary was made the occasion for a celebration in his honor at Berlin, and the world of medicine and science in general united in paying tribute to him. He was born in Pomerania, October 31, 1821, and received his medical education at Berlin, being appointed, in 1847, to the staff of the *Charité*, a hospital where many famous physicians have served. He was made a lecturer at the university, but his liberal tendencies in politics and his sympathy with the uprisings of 1848 prevented his holding such a position, and for a long time militated against his receiving governmental honors. The University of Würzburg, however, found a place for him in its scientific faculty, and he soon organized a laboratory of pathology, to which were attracted students and investigators from all parts of the world. In 1856 he returned to Berlin to become professor in the university. In 1858 he published his great work, *Cellular Pathology*, in which he demonstrated that pathological tissues are collections of cells. This was followed by many researches dealing with the origin of diseases, and the publication of numerous scientific papers. In politics Virchow was no less active than in science, and he served in the Prussian Chamber from 1862 to 1878. In 1887 he lost his position as rector of the University of Berlin on account of his extreme liberal views, but was restored to this office in 1892. In addition to his work as a scientist, Virchow is the author of many political and other writings, and is said to be the originator of the phrase "kultur kampf" to denote the opposition of the state to the reactionary church. In America, as well as in Berlin, several notable gatherings were held to celebrate Professor Virchow's birthday, and he was the recipient of congratulations from medical and scientific societies the world over.

VIRGINIA, a southern Atlantic State of the United States, has an area of 42,450 square miles. The capital is Richmond. The population in 1900 was 1,854,184, while in June, 1901, as estimated by the government actuary, it was 1,876,000. The populations of the four largest cities in 1900 were: Richmond, 85,030; Norfolk, 46,624; Petersburg, 21,810; and Roanoke, 21,495.

Finance.—The cash in the State treasury on October 1, 1900, was \$814,335.04. For the following year, ending September 30, 1901, the receipts were \$3,363,156.39 and the disbursements \$3,593,000.51, leaving in the State treasury \$584,490.92. On account of special funds, there was disbursed for the fiscal year: On account of the school fund, \$281,912.85, leaving a balance of \$202,746.41; on account of the public debt, \$708,980.86, leaving a balance of \$14,678.94; on account of the sinking fund there was disbursed \$415,434.48, leaving a balance of \$1,244.20; on account of the Miller fund there was disbursed \$64,613.65, leaving a balance of \$25,016.66. The total balance in the treasury to the credit of the general account and of the several funds amounted to \$1,098,177.13.

Industries.—Although Virginia is an agricultural State, the census reports for 1900 show that there has been a considerable growth in manufacturing and mechanical industries during the last half century. The population since 1850 has increased from 1,421,661 to 1,854,184, or 30.4 per cent., while the average number of industrial wage-earners has increased from 29,110 to 72,702, or 149.7 per cent., embracing in 1900 3.9 per cent. of the entire population, against 2 per cent. in 1850. In 1900 there was invested in the 8,248 mechanical establishments reporting a capital, exclusive of capital stock, of \$103,670,988. At the same time the gross value of the products was \$132,937,910, while the net value, exclusive of materials re-used in the process of manufacture, was \$97,233,277. The most important industry in Virginia is the manufacture of tobacco, having products in 1900 valued at \$21,278,266. In 1890 the value of these products was \$22,020,298, so that there has been a decrease of \$742,032, or 3.4 per cent. Flour and grist mill products ranked second among the industries of the State in 1900, having products valued at \$12,687,267, and showing an increase since 1890 of \$970,911, or 8.3 per cent. The large wheat production of the State, which was 6,330,400 bushels in 1899, has been for many years more than sufficient for local consumption, and large quantities of flour have been exported to the West Indies, South America, Africa, and Europe. The manufacture of lumber and timber products in 1900 had products valued at \$12,137,177, and showed the very large increase during the decade of \$6,506,577, or 115.6 per cent. In 1897 forests covered 23,400 square miles, or 58 per cent. of the land area of the State. Of this forest area about 75 per cent. was long-leaf and loblolly pine. This pine, and more especially the hardwood timber of the State, is being rapidly exhausted. Manufactures of steel and iron in 1900 had products valued at \$8,341,888, an increase during the decade of \$2,015,804, or 31.9 per cent. In 1899 Virginia ranked fifth in the United States in the production of iron ore, and besides this advantage for iron manufacturers, there is in the State a plentiful supply of fuel. Car construction and general railroad shop work in 1900 had products valued at \$6,277,279, an increase since 1890 of \$4,738,681, or 314.9 per cent. Fourteen of the railroads in Virginia have repair shops located there, and in addition to the general repair work, freight and passenger cars and locomotives are constructed in Virginia. The manufactures of foundry

and machine-shop products in the year 1900 were valued at \$4,833,137, an increase since 1890 of \$2,093,442, or 76.4 per cent. Several of these establishments make a specialty of tobaccoists' tools and machinery, and attention may also be called to the large iron and ship-building operations now carried on at Newport News and Richmond. Owing to the abundance of oak timber which supplies bark for tanning, the currying, finishing, and tanning of leather has rapidly increased in the State, the products in 1900 being valued at \$4,716,920, showing an increase since 1890 of \$3,323,433, or 271.3 per cent. Other industries are as follows: The manufacture of fertilizers, with products in 1900 valued at \$3,415,850; manufacture of textiles, \$3,282,583; and the manufacture of planing mill products, \$2,686,898.

Constitutional Convention.—In accordance with an act of the general assembly, approved March 5, 1900, submitting to the electors in May of that year the question of holding a constitutional convention, and in accordance with the affirmative result of that election, a special session of the legislature convened in January, 1901, and by an act approved February 6 provided plans for the election of delegates to the convention and for "submitting the revised and amended constitution to the people of the State of Virginia for ratification or rejection." It was directed that the delegates should be elected in May, and should convene on June 12. If the revised constitution were completed by October 5, 1901, then it should be submitted to the electors for ratification on November 5. But if the constitution were not completed by October 5, it should remain for the next general assembly to enact such measures as it deemed proper for putting the constitution in force. But this act of the assembly was not binding upon the convention, and it was believed that that body would declare the constitution in force instead of submitting it to the electors. For it was well known that one of the main purposes in revising the constitution was to restrict the negro vote; but if the vote were thus restricted, the negroes would naturally vote against the constitution's ratification, and to avoid this contingency it was necessary also to avoid their vote. Under the old constitution, enacted in the reconstruction days and under the supervision of the military authorities of the United States, all citizens of the State were declared to possess equal civil and political rights, and no amendments to the constitution could be made that in any way impaired the equal civil and political rights of both races. While these provisions had not been lived up to in Virginia for many years, it was widely felt that the partial disfranchisement of the negro should have the sanction of the law and should no longer be accomplished by underhand measures.

The convention met in June, 1901, as directed, but had not finished the drafting of the constitution by the end of the year. Great differences of opinion were developed as to whether, and, if so, how far, the suffrage should be restricted. On October 23, however, a bill of rights for the new constitution was affirmatively voted upon. The only clause of this bill of rights that differed materially from those that have been commonly adopted by northern States was the following: "That all elections ought to be free, and that all men, having sufficient evidence of permanent common interests with and attachments to the community, have the right of suffrage and cannot be taxed or deprived of or damaged in their property for public uses without their own consent or that of their representatives." From this clause it may be seen that so far Virginia has neither affirmed nor denied the right of the negroes to vote.

Negro Legislation.—At a special session of the legislature held in January, 1901, the legislation previously enacted, discriminating against negroes carried by transportation companies, was made more severe. By an act of 1900 it had been provided that commanders of steamboats should, where practicable, provide separate apartments for negroes. By the law of 1901 separate apartments for negroes on steamboats were made obligatory, and this, notwithstanding the fact that on boats which ply both in Maryland and Virginia, negroes can clearly claim the right to enter into any saloon or stateroom under the protection of the interstate commerce law. In another respect, however, the legislature apparently showed itself timid of bringing a contest on the negro question into the Federal courts, for the law of 1900, which required all railroads to furnish separate cars for negroes was amended in 1901 to exclude from the provisions of the law Pullman cars, as well as trains doing a through or interstate business. Both in Virginia, and in other southern States, like Arkansas, proposals were made to force street railway companies to provide separate cars or compartments for blacks and whites. But the large additional expense in which this would involve the street railway companies brought so much opposition from them as to defeat the project.

Elections.—In the fall elections of 1901, A. J. Montague, the Democratic candidate for governor, defeated his Republican opponent, J. H. Hoge. The votes cast were: Montague, 116,682; Hoge, 81,366. The issues of the campaign were largely based upon the calling of the constitutional convention. The Republicans endeavored to convince the illiterate voters of the southwestern counties that the Democrats intended to disfranchise them by inserting discriminating suffrage clauses in the new

constitution. The negroes, however, took but very little interest in the contest and did not vote up to their full strength in the election. The Democratic plurality at the election was a little more than that of the previous year, but much less than at the last election for governor. It was stated by the Republicans that the Democratic victory at the polls and the Democratic majority in the legislature insured by the election signified the adoption by the constitutional convention of radical suffrage restrictive clauses in the new constitution.

State Officers—Governor, elected for four years ending January 1, 1906, A. J. Montague, Democrat; lieutenant-governor, J. E. Willard; treasurer, A. W. Harman, Jr.; auditor, Morton Marye; attorney-general, W. A. Anderson; superintendent of public instruction, J. W. Southall. Supreme Court of Appeals—Chief justice, James Keith; associate justices, Richard H. Caldwell, John A. Buchanan, George M. Harrison, and Stafford G. Whittle—all Democrats.

Congressional Representatives (57th Congress).—In the House: William A. Jones, from Warsaw; Harry L. Maynard, from Portsmouth; John Lamb, from Richmond; Francis R. Lassiter, from Petersburg; Claude A. Swanson, from Chatham; Peter J. Otey, from Lynchburg; James Hay, from Madison; John F. Rixey, from Brandy; William F. Rhea, from Bristol; and Henry D. Flood, from West Appomattox—all Democrats. In the Senate: John W. Daniel (until 1905), from Lynchburg, and Thomas S. Martin (until 1907), from Scottsville—both Democrats.

VIRGINIA, UNIVERSITY OF, Charlottesville, Va., chartered in 1819, open for its first session in 1825. Under the leadership of Thomas Jefferson, it was the first American institution founded on true university lines. There are five departments: Academic, engineering, law, medicine, and agriculture. The library has recovered from the effects of the disastrous fire of 1895, and now contains about 50,000 volumes. The faculty consists of 23 professors and 37 instructors and assistants. The attendance in 1901 was 680, of whom 225 were in the academic department, 195 in the law, 174 in the medicine, and 33 in the engineering department. This is an increase of 34 over the attendance of the previous year. During the year the university occupied for the first time its new hospital, which cost \$26,000. The year was somewhat unfortunate in being marked by much sickness, the students having especially suffered from diseases that became epidemic, requiring for some time the suspension of recitation exercises.

VIRGIN ISLANDS. See LEEWARD ISLANDS.

VITAL STATISTICS. Statistics gathered by Dr. Brandreth Symonds, and published in 1901 demonstrate that women possess greater vitality than men. In the first year of life the mortality of the female is 9.25 per cent., while that of the male is 11.24 per cent. At the end of the first year the relative mortalities are: Male, 3.51 per cent.; female, 3.18 per cent. A similar difference continues up to the fourth year. From 5 to 12 years of age the male mortality is 0.356 per cent., the female, 0.428 per cent. From 46 to 56 the male mortality gains rapidly, being 0.632 per cent., against 0.347 for the females, annually. After 56 the female mortality increases, but remains always slightly below that of the male. It must also be remembered that there are more female than male births. The following figures are compiled from the *Public Health Reports* of the United States Marine Hospital Service, and represent the records kept by the surgeons in that service of the cases brought to their notice. These figures are incomplete and the totals are inaccurate, because of the absolute failure of inhabitants to report disease in many localities. In many instances the number of deaths reported far exceeds the total cases of the same disease, as reported. Frequently, also, the report will be "plague raging," or "cholera epidemic," no figures being given. No claim, therefore, is made that the tables as compiled are perfect; they give only an approximation of the truth. The record of bubonic plague in foreign countries, as compiled from these *Reports*, is as follows, from December 28, 1900, to December 27, 1901: Africa, 1,474 cases, 694 deaths; Australia, 28 cases, 10 deaths; Brazil, 169 deaths; China, 11,357 deaths, plus probably 5,000 more deaths in localities in which it was reported as "prevailing"; Egypt, 211 cases, 95 deaths; England, 14 cases, 11 deaths; France, 15 cases; Hawaiian Islands, 13 fatal cases; India, 542,877 deaths; Italy, 26 cases, 8 deaths; Japan, 3,643 deaths; Mauritius, 238 cases, 225 deaths; Mozambique, 5 cases; Paraguay, 1 case; Philippines, 497 cases, 375 deaths; Russia, 223 cases, 118 deaths; Scotland, 5 cases, 1 death; Straits Settlements, 30 cases, 30 deaths; Turkey, 38 cases, 19 deaths (incomplete); Wales, 1 death; Argentina, 3 cases, 1 death; Formosa, 472 cases, 357 deaths; Madagascar, 1 case; Réunion, 12 cases, 5 deaths. From another source it was learned that Spain had 12 cases, with 4 deaths. Total deaths from bubonic plague, 565,139. In the United States, during the same period, there were 28 cases of plague, with 25 deaths, all in San Francisco.

The extent of smallpox in foreign countries from December 28, 1900, to December 27, 1901, as compiled from the *Reports*, was as follows: Argentina, 1,161 deaths; Austria-Hungary, 288 cases; Arabia, 4 deaths; Africa, 2 deaths; Bahamas, 1 case;

Belgium, 133 cases, 59 deaths; Brazil, 2,010 deaths; British Columbia, 11 cases; Canada, 1,110 cases, deaths not stated; Ceylon, 12 deaths; China (very incomplete statement), 85 cases, 61 deaths; Colombia, much over 900 cases; Cuba, 4 cases; Ecuador, 63 deaths; Egypt, 28 deaths; England, 358 cases, 193 deaths; Formosa, 74 cases, 2 deaths; France, 466 deaths; Germany, 5 cases, 1 death; Gibraltar, 9 cases; Greece, 8 cases, 1 death; Hawaiian Islands, 2 cases, 1 death; India, 2,524 deaths; Ireland, 5 cases, 1 death; Italy, 2,646 cases; Japan, 18 cases, 9 deaths; Korea, "present," 1 death; Malta, 11 cases, 1 death; Manitoba, 8 cases, 0 deaths; Mozambique, "present"; Mexico, "epidemic"; New Brunswick, 228 cases; Netherlands, 26 cases; Nova Scotia, 101 cases, 2 deaths; Philippines, 103 cases, 2 deaths; Porto Rico, 253 cases; Russia, 555 deaths; Scotland, 238 deaths; Sicily, "prevalent" early in the year, 136 cases, with 27 deaths, reported later; Spain, 440 deaths; Straits Settlements, 13 deaths; Switzerland, 15 cases, 0 deaths; Syria, "present"; Turkey, 1 case; Uruguay, 553 cases; Prince Edward Island, 1 case, 0 death; Wales, 2 cases, 0 deaths. The total number of cases or deaths cannot be stated even approximately, so incomplete are the reports from Brazil, China, Egypt, India, Korea, Mexico, the Philippines, Russia, Spain, and Turkey. The obtainable figures of the great epidemic of smallpox in the United States, as published in the *Reports*, between December 28, 1900, and December 27, 1901, were as follows: Alabama, 46 cases, 3 deaths; Alaska, prevailing among the Indians, 5 white cases; Arkansas, 10 cases, 0 deaths; California, 161 cases, 7 deaths; Colorado, 3,101 cases, 3 deaths reported; Connecticut, 19 cases, 0 deaths; Delaware, 58 cases, 0 deaths; District of Columbia, 64 cases; Florida, 135 cases, 1 death; Georgia, 388 cases, 3 deaths; Idaho, 10 cases; Illinois, 645 cases, 3 deaths; Indiana, 1,586 cases, 13 deaths; Indian Territory, 266 cases, besides "several"; Iowa, 188 cases, 2 deaths; Kansas, 5,717 cases, 32 deaths; Kentucky, 225 cases, 2 deaths; Louisiana, 3,523 cases, 513 deaths; Maine, 26 cases, 0 deaths; Maryland, 39 cases, 0 deaths; Massachusetts, 614 cases, 75 deaths; Michigan, several hundred cases; Minnesota, 7,516 cases, 24 deaths; Mississippi, 772 cases, 12 deaths; Missouri, 602 cases, 6 deaths; Montana, 218 cases, 2 deaths; Nebraska, 990 cases, 4 deaths; Nevada, 1 case; New Hampshire, 383 cases (incomplete); New Jersey, 555 cases, 58 deaths; New Mexico, 4 cases; New York, 2,089 cases, 403 deaths; North Carolina, 1,432 cases, 5 deaths; North Dakota, 153 cases, 1 death; Ohio, 5,494 cases, 68 deaths; Oklahoma, 640 cases; Oregon, 55 cases; Pennsylvania, 2,253 cases, 87 deaths; Rhode Islands, 41 cases; South Carolina, 12 cases, 1 death; Tennessee, 6,511 cases, 200 deaths; Texas, 637 cases, 10 deaths; Utah, 870 cases, 4 deaths; Vermont, 49 cases; Virginia, 393 cases, 5 deaths; Washington, 567 cases, 3 deaths; West Virginia, 141 cases, 1 death; Wisconsin, 1,797 cases, 29 deaths; Wyoming, 90 cases. Total, 48,206 cases, 1,127 deaths. The *Reports* publish the following figures regarding cholera in foreign countries during the year December 28, 1900, to December 27, 1901: Argentina, 2 cases; China, 7 deaths; India, 4,066 deaths; Straits Settlements, 302 deaths; Borneo, 100 cases 69 deaths; Egypt, 6 cases, 1 death; Japan, 14 cases, 4 deaths; Java, 4,025 cases, 2,944 deaths; Sumatra, 88 cases, 53 deaths. The yellow fever record for the same period is as follows: Brazil, 321 deaths; Colombia, unknown; Costa Rica, 31 cases, 17 deaths in one locality, "prevalent" elsewhere; Cuba 174 cases, 53 deaths; Haiti, 3 cases, 2 deaths; Jamaica, "present"; Mexico, 245 cases, 130 deaths, besides being epidemic in Valladolid; Salvador, "several" cases and deaths; Dutch West Indies, 13 cases, 4 deaths; Windward Islands, 8 cases, 6 deaths. See PLAGUE; SMALLPOX; TUBERCULOSIS.

VIVISECTION. The opposition, led by eminent physicians, to measures proposed in 1900 whereby scientific research would be limited or abolished in all cases wherein live animals were used for experimentation, has resulted in a lull in the strife between anti-vivisectionists and advocates of callisection. Most of the active anti-vivisectionists were silenced by the opinions and arguments expressed by many leading scholars and physicians. A résumé of the arguments of the "antis" was published by James M. Brown, president of the American Humane Association, in a document issued in January, 1901. An analysis of this document, with large quotations from it, and an extensive reply, was published by Professor W. W. Keen in the *Philadelphia Medical Journal* for February 23, 1901.

VOLUNTEERS OF AMERICA, a philanthropic and religious organization founded in 1896. Its work is conducted under a military discipline suggested by that of the United States Army, though its government is vested in an essential democracy based on the constitution. The organization now includes six regiments, nine companies or central societies, and nearly one hundred self-supporting posts, not including outposts. These societies raised \$81,013 in their own support in the past year. The annual meeting of the Volunteers was held at Carnegie Hall, New York City, on November 12, 1901, when interesting reports for the year were offered. An aggregate congregation for the year of over 4,100,000 persons was present at the outdoor and indoor meetings of the various agencies. The following statement illustrates the enterprise of the organization in the past year. "The Volunteers have five branches of philanthropic work. Through their Sociological branch, which

embraces the homes that are provided for destitute and working men, they have received 234,814 men, and fed some 371,297 persons at a nominal cost. There are four of these homes in Chicago and one each in Joliet, Kansas City, Brooklyn, and Philadelphia. Through the Home of Mercy Branch, the homes in Newark and Boston, 348 women have been helped and cared for, while through the Volunteer Tenement Work, recently started, 1,563 families have been visited, and over 4,500 have been helped with food and clothing. Through the Volunteer Prison League in 13 State prisons, 12,000 members have been enrolled, while over 2,000 have graduated from the Hope Halls, one leased in Chicago, another owned by the Volunteers in Flushing, 75 per cent. of whom are known to be doing well." The volunteers maintain headquarters in Cooper Square, New York City, and are represented officially by the *Volunteers' Gazette*. President and commander-in-chief, Ballington Booth.

VRIES, HUGO DE. See BIOLOGY.

WAITE, DAVID HANSON, former governor of Colorado, died in that State, November 27, 1901. He was born at Jamestown, N. Y., April 9, 1825, and was educated in the public schools and at the Jamestown Academy. After studying law he settled in Wisconsin, and in 1857 was elected to the State legislature. From Wisconsin he went to Missouri in 1859; in 1861 he returned to New York, where he edited and later controlled a local newspaper; in 1876 he went to Kansas, where he practiced law and conducted a ranch; and in 1881 he moved to Aspen, Colo., and became editor of the *Union Era*, a reform paper. He was one of the organizers of the People's Party in 1892, and in 1893 was elected governor of Colorado on the Populist ticket. While in this office he attracted considerable notice by reason of his opposition to capital and his strong advocacy of free silver.

WALES, Prince of, GEORGE FREDERICK ERNEST ALBERT, heir apparent of the British throne, was born at Marlborough House, June 3, 1865, the second son of Prince Albert Edward, now king of England. He was educated under private tutors. In 1871 he entered the British navy as a midshipman, and on January 1, 1901, was made a rear-admiral. On January 22, 1901, he succeeded his father as Duke of Cornwall, adding this to his former title of Duke of York. On March 16 the Duke, accompanied by his wife, began a tour of the British colonies. On his return to England he received the title of Prince of Wales (November 9, 1901). See GREAT BRITAIN (paragraph Tour of the Heir Apparent).

WALKER, JAMES ALEXANDER, Confederate brigadier-general, died at Wytheville, Va., October 20, 1901. He was born in Augusta County, Va., August 27, 1832, and was educated at the Virginia Military Institute. After studying law at the University of Virginia, he was admitted to the bar in 1850. In the Civil War he rose in rank in the Confederate service from captain to brigadier-general, and after the death of General Jackson was in command of the famous "Stonewall" brigade. General Walker was lieutenant-governor of Virginia in 1877 and was twice elected to Congress (1894 and 1896).

WALLACE, WILLIAM HENRY, Confederate brigadier-general, died at Union, S. C., March 21, 1901. He was born there in 1824. He graduated at the South Carolina College and became a planter. In the Civil War he served in the Confederate army, rising to the rank of brigadier-general, and afterward played an active part in the politics of his State during the reconstruction period. He was a circuit judge from 1877 until 1893.

WALTON, WILLIAM, English mathematician and educator, died at Little Shelford, near Cambridge, England, June 9, 1901. He was born in 1813. He graduated from Trinity College, Cambridge, in 1836, and remained there as tutor and lecturer in mathematics. Among his mathematical works are: *Problems in Theoretical Mechanics* (1842); a *Treatise on Differential Calculus* (1846); a *Collection of Problems in Hydrostatics and Hydrodynamics* (1847); and *Problems in Plane Coordinate Geometry* (1851).

WANTAGE, First Baron, ROBERT JAMES LOYD-LINDSAY, died at Wantage, England, June 10, 1901. He was born in 1832, was educated at Eton, and entered the army in 1850. In the Crimean War he received the Victoria Cross, and rose to the rank of colonel in 1860. In 1865 he was elected to Parliament, where he remained until 1895, and during the years 1877-80 was financial secretary to the war office. He was raised to the peerage in 1881. From the time of the Franco-Prussian War until his death he was chairman of the British Red Cross Society.

WARR, GEORGE CHARLES WINTER, classical scholar, died in London, England, February 21, 1901. He was born at Oakville, Toronto, May 23, 1845, and was taken to England in boyhood. He was educated at Christ's and Trinity colleges, Cambridge, and in 1870 was elected a fellow of Trinity, but did not serve, on account of the religious tests then existing. He became classical lecturer at King's College, London, in 1874, and professor of classical literature there in 1881, as well as professor of Latin at Queen's College, which he assisted in founding, 1877. He was

secretary of the Cobden Club, 1869-73, and was active in all educational matters. He wrote the *Tale of Troy* (1833), and the *Story of Orestes* (1886), classical masques which he also presented; *The Greek Epic* (1895); and *The Oresteia of Æschylus*, a verse translation and commentary (1901). He also translated Teuffel's *History of Roman Literature* (1890).

WASHINGTON, a Pacific coast State of the United States, has an area of 69,180 square miles. The capital is Olympia. Washington was organized as a Territory March 2, 1853, and admitted as a State November 11, 1889. The population in 1900 was 518,103, while in June 1901, as estimated by the government actuary, it was 535,000. The populations of the three largest cities in 1900 were: Seattle, 80,671; Tacoma, 37,714; and Spokane, 36,848.

Finance.—The Washington State debt consists of a funded debt of \$100,000 and \$1,245,000, representing bonds issued for investment in the permanent school fund; there is also a floating debt of \$399,838. Cash in the general fund amounts to \$186,240.05. The total value of property in the State, as returned for taxation in 1901, was \$260,180,734. The tax rate per \$1,000 for 1901 was \$7.60, including \$5 for school purposes.

Industries.—From preliminary reports of the census of 1900 as to the industries of Washington, it appears that there was at that time invested in the 3,631 manufacturing establishments reporting, a capital, exclusive of capital stock, amounting to \$52,649,760. These figures show a very large increase since 1890, when there were only 1,543 mercantile establishments, with capital invested amounting to \$34,309,735. The capital invested in 1900 was distributed as follows: In land, \$10,504,214; in buildings, \$5,342,640; machinery and implements, \$15,563,736, and in cash and sundries, \$21,239,170. The total number of salaried persons in 1900 was 2,242, and the salaries paid annually amounted to \$2,154,024. At the same time the total number of wage-earners was 33,806, as against 18,677 in 1890, and the total wages paid was \$19,106,873, as against \$11,011,804 in 1890. Of the wage-earners in 1900, 32,325 were men, drawing wages of \$18,669,237; 1,206 were women, drawing wages of \$383,970, and 265 were children under 16, drawing wages of \$53,666. The gross value of the products of the manufacturing industries in 1900 was \$86,795,051, representing an increase of over 100 per cent. since 1890, when the products were valued at \$41,768,022. In 1890 the cost of materials used in the manufacturing industries was \$49,099,182, and miscellaneous expenses amounted to \$3,860,455. In 1900 Washington was the thirty-third State of the Union in population, while in the value of its manufacturing industries it was the twenty-ninth State.

Legislation.—Among labor laws passed by the Washington Legislature in 1901 were the following: An act providing that no woman be employed in any mechanical or mercantile establishment, laundry, hotel, or restaurant more than ten hours in each day, and prescribing that every employer in such establishments provide suitable seats for employees and permit the employees to use them. An act for the prevention of accidents on street railways provides that all street railway companies shall henceforth, except in cases of a strike, employ as motormen, gripmen, or conductors only those who have had at least three days' regular and personal instruction on the particular railway line upon which they are to be employed. Two interesting corporation laws were enacted. The first, intended for the protection of small stockholders in mines, provided that any owner of stock to the amount of 1,000 shares in any mining company or corporation, should have the right fully to inspect the company's property either below or above ground. And the exhibit of 1,000 shares in stock should be construed as an order on the company to permit such inspection at any time; and if they did not permit this, their charter might be vacated. Another law, whose object was to prevent discrimination in freight rates so far as possible, enacted that railway companies should weigh all cars loaded with lumber, shingles, or other forest products shipped in the State, and should make their freight charges in accordance with the weights ascertained. The use of the American flag for advertising purposes was prohibited. Applications made to Congress under Article V. of the Constitution for a convention to propose an amendment to the Constitution for the direct election of Senators. The penalty for kidnapping was raised from the maximum of 3 years' imprisonment to a maximum of 21 years' imprisonment.

State Officers.—Governor, John R. Rogers, Democrat-Populist, elected for four years ending January 14, 1905; lieutenant-governor, Henry McBride, Republican; secretary of state, Samuel H. Nichols, Republican; treasurer, C. W. Maynard, Republican; auditor, J. D. Atkinson, Republican; attorney-general, W. B. Stratton, Republican; superintendent of education, W. B. Bryan, Republican; land commissioner, S. A. Calvert, Republican. Supreme Court—Chief Justice, J. B. Reavis, Democrat; associate justices, W. H. White, Democrat; R. O. Dunbar, Republican; M. A. Fullerton, Republican; T. J. Anders, Republican; Wallace Mount, Republican; and H. E. Hadley, Republican. Governor Rogers (*q.v.*) died December 26, 1901.

Congressional Representatives (57th Congress).—In the House: Wesley J. Jones, from North Yakima, Republican, elected at large, and Francis W. Cushman, from Tacoma, Republican. In the Senate: George Turner (until 1903), from Spokane, Democrat, and Addison G. Foster (until 1905), from Tacoma, Republican.

WASHINGTON MEMORIAL INSTITUTION. See **CARNEGIE INSTITUTION.**

WASHINGTON UNIVERSITY, St. Louis, Mo., founded 1853. During the year 1900-01 the faculty numbered 189 and the students 2,055. These figures include three preparatory schools that are organized under the charter of the university. Great progress has been made on the new buildings, which, with the new grounds just west of Forest Park, were made possible by the \$5,000,000 gift of 1900. These, together with the whole site, including 110 acres, have been taken over by the Louisiana Purchase Exposition Company and will not be used for university purposes until the exposition is over. The university has received a gift of \$100,000 from Mrs. Eliza A. How, \$25,000 by the will of Colonel George E. Leighton, and \$20,000 by the will of Mr. William E. Huse. The arrangement with the exposition company will result in the erection of several more buildings.

WATERMAN, LEWIS EDSON, American inventor and manufacturer, died in Brooklyn, New York City, May 1, 1901. He was born at Decatur, N. Y., November 20, 1836, and early in life turned his attention to invention. Taking as a basis the old self-feeding stylus, Mr. Waterman worked for ten years to produce a practical fountain-pen, and was the first to put one of this kind on the market. Mr. Waterman also originated a successful process for preserving and condensing the juice of grapes.

WATER PURIFICATION. About \$12,000,000 of work for the improvement of the water supply of Philadelphia was under contract in 1901. Most of this expenditure will be for slow sand filtration plants at or near the various pumping stations. Contracts for large mechanical filtration plants were awarded during the year at Louisville, Ky., and at Little Falls, N. J. The water from the latter plant will be supplied to Paterson, Passaic, and other municipalities in the vicinity. Both of these mechanical filter plants differ from those previously built in having unusual facilities for coagulation, prior to the introduction of the water to the filters. At Louisville, the water will be pumped, as at present, from the Ohio River to a 100,000,000-gallon settling reservoir. From the latter the partially clarified water will pass to a large cylindrical coagulating tank, where the sulphate of alumina or other coagulant will be given an opportunity to act upon the water. Next the water will pass to the filters. Three of these are planned, each about 30 x 147 feet in plan and 8 feet deep, built of riveted steel plates. The area of each filter tank will be 0.1 acre, and the daily capacity, when working at the rate of 125,000,000 gallons per acre, will be 12,500,000 gallons per bed. The sand which serves as a filtering medium will be supported on wire netting and wire cloth. The filter beds will be washed by reversing the flow of water, and the washing process will be aided by agitators or revolving horizontal arms, lowered into the sand by means of vertical screw shafts. A set of 72 agitators will be mounted on an overhead trolley car, which can be moved from bed to bed. The car will be moved and the agitators driven by electric motors. The filters are being erected over a portion of a 25,000,000-gallon clear-water reservoir, which is covered by concrete and steel groined arches. The Little Falls plant will include a rectangular coagulating basin with a capacity of 1,700,000 gallons, equal to one hour's flow at a rate of 40,000,000 gallons purified per day; 32 filters, each 24 x 15 feet in plan; and a 3,500,000-gallon clear-water basin. The walls of the coagulating basin, filter tanks, and clear-water basin will be of concrete, as will also the tank bottoms and floors or roofs over the tank, but the floors and roofs will be strengthened by steel rods. The filtering medium will be sand, which will be agitated, in washing, by means of compressed air, delivered through perforated pipes. Each of the 32 filter units will have a normal capacity of 1,000,000 gallons a day.

Slow sand filtration has been virtually adopted for Washington, D. C., but lack of Congressional appropriations will prevent, for some time, further steps than the purchase of land and preparation of plans. At Pittsburg, Pa., plans for settling reservoirs and slow sand filter beds were practically completed at the close of 1901, and bids for construction were about to be invited. Full illustrated descriptions of the proposed purification works at Louisville and Little Falls respectively were published in *Engineering News* for January 17 and May 9, 1901. An exhaustive description of the slow sand filtration plant at Lawrence, Mass., with details of its operation for the six years 1895 to 1900, and of the effect of pure water on the typhoid death-rate, was read before the American Society of Civil Engineers on June 5, 1901, and published in the *Transactions* of the Society for the year 1901. The authors of the paper were Messrs. Morris Knowles and Charles G. Hyde. In *Engineering News* for May 30, 1901, the Lawrence figures for the cost of operation were compared, so far as possible, with a six-years' record for similar filters at Mount Vernon, N. Y.,

and with a much shorter record for Albany, N. Y. For the fiscal year 1900, the cost of filtration at Lawrence was \$7.70 per 1,000,000 gallons, and at Mount Vernon it was \$4.05. At Albany the cost for practically the same items was \$1.95. No capital charges were included in either case. The Albany filters are not only larger, but are also covered, both of which features reduce the cost of operation.

WATER-WORKS. A public water supply is now so well recognized a municipal necessity that few places with a population of 3,000 are without works which afford water for household and manufacturing purposes and for fire protection and other public uses. But, in hundreds of municipalities, both great and small, the water furnished is unsatisfactory or even dangerous in quality, while a constant struggle is everywhere in progress to secure a sufficient quantity of water and large enough pipe systems, pumps, and reservoirs to meet the rapidly increasing consumption. Since waste, rather than use, is responsible for a large part of this demand, the efforts of water-works managers are now being directed very largely to secure its reduction. To this end, water metres are being introduced throughout the country as rapidly as public sentiment will permit. Besides keeping down the waste, metres provide the fairest means of charging for the service, and, by reducing the amount required, greatly simplify the problem of securing pure water. The accompanying tables on water consumption and the use of metres in the fifty largest cities of the United States, taken from *Engineering News* for April, 1901, are particularly interesting in this connection. They show the per capita water consumption and the percentage of taps or services metred in both 1890 and 1900, together with the increase or decrease in consumption during that period, and the rank of the cities in consumption. It will be noticed, in Table II., that notwithstanding the increase in the use of metres the number of cities having a consumption of over 100 gallons per capita was 28 in 1900, against 18 in 1890; but it is also evident that the cities with the fewest metres are generally the ones with very high figures of consumption, while a large percentage of taps metred is accompanied, as a rule, with low consumption. The figures for 1890 were taken originally from the *Manual of American Water-Works* for 1891, while those for 1900 were collected by Mr. Geo. I. Bailey, of Albany, N. Y. Mr. Bailey's figures were intended to cover nearly all the cities in the United States having a population of 25,000 and upwards. Replies from 134 of the 159 cities in the list showed an average per capita water consumption of 137 gallons, and that those cities having less than 10 per cent. of their taps metred consumed 153 gallons; while the average per capita consumption, where over 50 per cent. of the taps were metred was only 62 gallons, or 45 per cent. of the average for the whole 134 cities. See ELECTROLYSIS; FIRE PROTECTION, and WATER PURIFICATION.

TABLE I.

Percentage of taps metred and per capita water consumption in the 50 largest cities of the United States in 1890 and in 1900, arranged in order of population.*

Rank.	Cities.	Per cent. taps metred.		Per capita consumption.		Increase or decrease, consumption, in 10 years.	Rank.	Cities.	Per cent. taps metred.		Per capita consumption.		Increase or decrease, consumption, in 10 years.
		1890.	1900.	1890.	1900.				1890.	1900.	1890.	1900.	
						<i>Galls.</i>							<i>Galls.</i>
1	New York†.....	20.2	.....	79	116	+ 37	26	Denver.....	0.8	1.2	.....	300	.....
2	Chicago.....	3.3	.....	140	190	+ 50	27	Indianapolis.....	7.6	6.0	71	79	+ 8
3	Philadelphia.....	0.3	0.5	132	229	+ 97	28	Allegheny.....	0.0	.....	238	.....	.....
4	Brooklyn†.....	2.5	.....	72	.....	.....	29	Albany.....	0.4	12.3	.....	.....	.....
5	St. Louis.....	8.2	6.3	72	159	+ 87	30	Columbus.....	6.4	34.0	78	230	+152
6	Boston.....	5.0	5.5	80	143	+ 63	31	Syracuse.....	14.6	47.3	68	102	+ 34
7	Baltimore.....	0.1	1.5	94	97	+ 3	32	Worcester.....	89.4	94.3	59	70	+ 11
8	San Francisco.....	41.4	23.0	61	73	+ 12	33	Toledo.....	9.4	50.3	72	119	+ 37
9	Cincinnati.....	4.1	7.6	112	121	+ 7	34	Richmond.....	1.4	30.4	167	100	+ 67
10	Cleveland.....	5.8	4.9	103	159	+ 56	35	New Haven.....	.....	2.6	135	150	+ 15
11	Buffalo.....	0.2	1.6	186	233	+ 47	36	Paterson.....	.....	20.7	128	129	+ 1
12	New Orleans.....	0.4	.....	37†	48†	+ 11	37	Lowell.....	22.9	52.5	66	85	+ 19
13	Pittsburg.....	0.2	0.6	144	231	+ 87	38	Nashville.....	0.8	41.5	146	140	- 6
14	Washington.....	0.3	2.7	158	185	+ 27	39	Scranton.....	74.6	94.3	29	36	+ 7
15	Detroit.....	2.1	10.0	161	146	- 15	40	Fall River.....	2.4	6.1	64	79	+ 15
16	Milwaukee.....	31.9	67.6	110	80	- 30	41	Cambridge.....	89.6	91.6	36	84	+ 48
17	Newark.....	2.4	21.9	75	93	+ 18	42	Atlanta.....	3.7	8.3	124	125	+ 1
18	Minneapolis.....	6.3	27.5	97	160	+ 63	43	Memphis.....	0.2	4.3	113	90	+ 23
19	Jersey City.....	1.9	2.0	97	100	+ 26	44	Wilmington.....	3.8	46.7	47	82	+ 15
20	Louisville.....	5.9	7.5	74	176	+ 102	45	Dayton.....	8.9	4.2	125	183	+ 58
21	Omaha.....	19.4	34.6	66	88	+ 22	46	Troy.....	.....	13.4	.....	156	.....
22	Rochester.....	11.4	25.3	65	87	+ 7	47	Grand Rapids.....	0.1	4.0	76	82	+ 17
23	St. Paul.....	4.2	28.2	60	87	+ 7	48	Reading.....	.....	1.4	131	280	+149
24	Kansas City.....	17.6	40.0	71	62	- 9	49	Camden.....	.....	.....	62	99	+ 37
25	Providence.....	52.4	82.6	48	54	+ 6	50	Trenton.....	.....	.....	.....	.....	.....

* The classification is by the census of 1890, so as to include all the cities in the earlier grouping.

† New York and Brooklyn consolidated since 1890.

‡ Only a small part of the population supplied.

TABLE II.

Water consumption and percentage of taps metred in the 50 largest cities of the United States, arranged in order of consumption.*

In 1891									
Rank.	Cities.	Consump- tion.	Percent. taps metred.	Rank					Percent. taps metred.
		Gals.							
1	Allegheny.....	238	0 0	2					...
2	Buffalo.....	186	0 2	2					47.3
3	Richmond.....	187	1 4	2					30.4
4	Detroit.....	161	2 1	2					7.6
5	Washington.....	158	0 3	2					...
6	Nashville.....	146	0 8	2					1.5
7	Pittsburg.....	144	0 2	2					31.9
8	Chicago.....	140	—	2					27.6
9	New Haven.....	135	...	2					9.0
10	Philadelphia.....	132	0 3	2					4.3
11	Camden.....	131	Small	2					32.5
12	Paterson.....	128	Small	3					31.6
13	Troy.....	125	8 9	3					26.3
14	Memphis.....	124	8 7	3					67.6
15	Wilmington.....	113	0 2	3					6.1
16	Cincinnati.....	112	4 1	3					6.0
17	Milwaukee.....	110	31 9	3					23.0
18	Cleveland.....	108	5 8	3					34.3
19	Jersey City.....	97	1 2	3					28.2
20	Baltimore.....	94	0 1	3					38.6
20	Omaha.....	94	19 4	3					46.7
21	Boston.....	80	5 0	3					32.6
22	New York.....	79	20 2	4					34.3

* A few cities are omitted from each list, on account of missing figures. This table is based on Table I., which in turn was based on the classification of the census of 1890, instead of that of 1900.

† In Denver, water is used for irrigation.

WEAVER, JONATHAN, D.D., bishop emeritus of the United Brethren Church, died at Dayton, O., February 6, 1901. He was born in Carroll County, O., February 23, 1824, and after a high-school education entered the ministry in 1845 and was ordained in 1847. He was chosen bishop in 1865, and was reelected seven times. A prolific writer, he was widely known in church circles for his many religious books and for his contributions to religious periodicals. Among his works are: *Discourses on the Resurrection* (1871); *Ministerial Salary* (1872); and *Divine Providence, the History of the Doctrine* (1873).

WEINHOLD, KARL, philologist, died in Berlin, Germany, August 15, 1901. He was born at Reichenbach, in Silesia, October 26, 1823, and was educated at Breslau and Berlin, where he studied theology and philology. In 1847 he went to Halle to study German philology and literature, and in 1849 was chosen a professor at the University of Breslau. A year later he went to Kratau, in 1851 to Gratz, and in 1861 to Kiel, in which place he remained until 1872, and from 1889 until his death occupied the chair of Germanic philology at the University of Berlin. Professor Weinhold published numerous works, dealing chiefly with Germanic philology and mythology.

WELLESLEY, Sir GEORGE GREVILLE, British admiral (retired), died in London, April 6, 1901. He was born in England in 1814, and joined the navy in 1827. During his fifty-two years of service in the navy, he participated in numerous campaigns all over the world, being promoted from the rank of commander to captain in 1844, to rear-admiral in 1863, and to admiral in 1875. In 1877 he was made a lord of the Admiralty, and he held this office until his retirement from active service in 1879.

WELLESLEY COLLEGE, for women, at Wellesley, Mass., established 1875, reports a faculty of 117 and a student-body of 819, including 22 candidates for the higher degree. During 1901, the great pressure of debt was removed by endowment funds amounting to \$169,000. The income for the year 1900-01 was \$263,506. The library contains over 54,000 volumes. A student-government agreement has been put into operation by which the student-body is governed by officers elected from the students.

WENNERBERG, GUNNAR, Swedish composer and poet, died at Stockholm, August 24, 1901. He was born at Lidköping, October 2, 1817, and was educated at the University of Upsala. In 1846 he was appointed to the chair of æsthetics at the University of Upsala. In 1875 he was elected to the Swedish parliament. As a composer, he wrote: *Frihetssaenger* (Songs of Liberty, 1848); *Gluntame* (1848), a

humorous song series in which two students of Upsala appear; *De Tre* (1850), a humorous trio; and *Serenade* (1851). Later he devoted himself to the composition of religious music, producing an oratorio, *la Naissance du Christ*, and setting to music the *Psalms of David*. His poems, which won for him an election to the Swedish Academy, were published in 1881 under the title *Samlade Skrifter*.

WESLEYAN METHODIST CONNECTION OF AMERICA. This branch of American Methodism, founded in 1843, now has 16,531 communicants and 699 ministers. It maintains Houghton Seminary, a school of college grade at Houghton, N. Y., and publishes the *Wesleyan Methodist*, Syracuse, N. Y.

WESLEYAN UNIVERSITY, Middletown, Conn., founded in 1831. The faculty consists of 30 professors and instructors, and the student-body of 320, of whom 273 are men and 47 women. The library contains about 61,000 volumes. During 1901, \$12,000 were set aside to pay for the tuition of worthy and needy students. The university owns property amounting to \$2,089,850, and the receipts for 1900-01 were \$134,638 exclusive of gifts. The alumni have been called upon to establish a fund of \$250,000. By the end of 1901 \$100,000 had been subscribed, and this will be expended in the erection of a new administration building. Another gift of \$25,000 provides for a second building, the purpose of which has not yet been announced. See PSYCHOLOGY, EXPERIMENTAL.

WESTCOTT, BROOKE FOSS, bishop of Durham, died at Durham Castle, England, July 27, 1901. He was born at Birmingham in 1825, and was educated at Trinity College, Cambridge. Ordained in 1851, he was, from 1852 to 1869, assistant master of Harrow School, and during this period wrote and published his *History of the Canon of the New Testament* (1855), a work of high authority. In 1870 he was made regius professor of divinity at Cambridge, where he remained for twenty years. He was appointed a canon of Westminster in 1884, and in 1890 resigned his Cambridge professorship to become bishop of Durham. Dr. Westcott's scholarship was sound, and *The Greek New Testament* (1881), the result of twenty-eight years of collaboration on the part of Dr. Westcott and Dr. Hort, is generally considered the final authority on textual criticism. Other works are *The Gospel of the Resurrection* (1866), and *The History of the English Bible* (1869).

WESTERN AUSTRALIA, the largest state of the Commonwealth of Australia, has an area of 975,920 square miles. The population, according to the census of 1901, was 182,553, against 49,782 in 1891, showing an increase of over 264 per cent., as compared with over 67 per cent. during the preceding decade. The capital is Perth, with a population of 36,200. About three-fourths of the population are Protestant and the rest Roman Catholic. Education is compulsory, but not free. In 1899, the government schools numbered 205, with 16,033 pupils.

Government and Finance.—At the head of the administration is the governor appointed by the crown and assisted by a responsible ministry. The legislative power devolves upon a council and an assembly. The revenue and expenditure for 1901 were £3,078,034 (£2,875,396 in 1900) and £3,165,244 (£2,615,675 in 1900) respectively. The revenue is obtained largely from customs and public services. The public debt in 1901 amounted to £12,709,430, against £11,674,640 in 1899.

Industries, Commerce, etc.—Western Australia is the chief gold producing state of the Commonwealth. The output amounted in 1900 to 1,580,950 ounces, against 1,643,877 ounces in 1899. There are only about 100,000 acres under crops, chiefly under wheat and hay. The live stock consisted in 1899 of 2,273,246 sheep, 296,267 head of cattle, and 65,817 horses. The imports and exports for 1901 amounted to £5,962,178 and £6,852,054 respectively. The exports consisted of gold, £3,799,116; timber, £458,461; and wool, £270,718. The railway lines, largely owned by the government, had a total length of 1,978 miles in 1900. The telegraph lines have a total length of over 26,000 miles.

History.—Sir John Forrest, who had been premier of the colony since the establishment of responsible government in 1890, resigned early in 1901 to become post-master-general in the first federal ministry and was succeeded by Hon. George Throssell. In the April elections two members of the Throssell ministry were defeated, and a new cabinet was formed by Hon. George C. Leake, taking office on May 27. The legislature met on June 28, being divided as to party affiliations as follows: Ministerialists, 18; Opposition, 18; Labor, 6; Independents, 5. The Independents and Labor members held the balance of power, but were inclined to support the ministry until it should prove itself incompetent. A serious strike on the government railways began in June, 1901, and continued until late in July. The difficulty was caused by the refusal of the government to raise the linesmen's wages a shilling a day. The government offered to arbitrate, but the strikers refused, thereby losing the support of the Labor members of the legislature, who publicly declared against them. Thousands were thrown out of employment, and shops, factories, and foundries were shut down throughout the country. The government found itself with practically a form of civil war on its hands and opponents of government ownership pointed to this as a natural consequence of the system. Public sentiment was against the strikers,

however, and the government's compromise plan for settlement was finally accepted toward the end of July. In August the minister of railways, Mr. Holmes, suspended Mr. Davis, the general manager of the state lines, on account of differences growing out of the strike. An examining board appointed to investigate the charges brought against him by the minister, decided, after prolonged sittings, that the minister himself and not the manager, was responsible for the defects in the administration of the system. This finding was laid before the legislature, where much time was spent in discussion and little in law-making. On October 24 all parties united in a resolution condemning the federal tariff bill which had been introduced into the federal House of Representatives on October 8. Debates on the railroad administration were again resumed, and on November 10 a motion of lack of confidence in the Leake ministry, proposed by Mr. Peisse, a prominent supporter of Sir John Forrest, was carried by a vote of 24 to 22. Mr. Peisse attempted to form a ministry, but failed, and the task was intrusted to Mr. Alfred Edward Morgans, who succeeded in organizing a coalition ministry. The coalition was short-lived, however, and upon three members of the cabinet being defeated at the polls, Mr. George Leake again became premier on December 22. The cable to Western Australia from Natal was opened in November.

WESTERN RESERVE UNIVERSITY, Cleveland, O., founded in 1884, two years after the removal of Adelbert College, founded in 1826, now its academic department, from Hudson, O., to Cleveland. The faculty during 1900-01 numbered 138, an increase of one over the previous year. The student-body numbered 783, an increase of 65 over the previous year, divided as follows: Graduate school, 16; Adelbert College, 226; College for Women, 222; medicine, 144; law, 100; dental, 91. The endowment amounts to about \$3,000,000, with a total income for the year of about \$225,000. The library contains about 13,000 volumes. The most important advance in the year was the decision to establish a new school in library training, which is to be organized as a two years' graduate course. With the close of the year 1901 the faculty determined to make the studies of the last three years of the course entirely elective. This extension of the elective system of studies into the sophomore year has led to the further change of giving one degree, the B.A., to all students who have completed the course. This recommendation is to take effect in the year 1904, in which year the class graduating shall have finished the course of study as it was constituted previous to the change. The historical character of President Thwing's report published in 1901 and summarizing the development of the curriculum of the college during the seventy-five years of its history, gives a basis for the study of the curricula of American colleges.

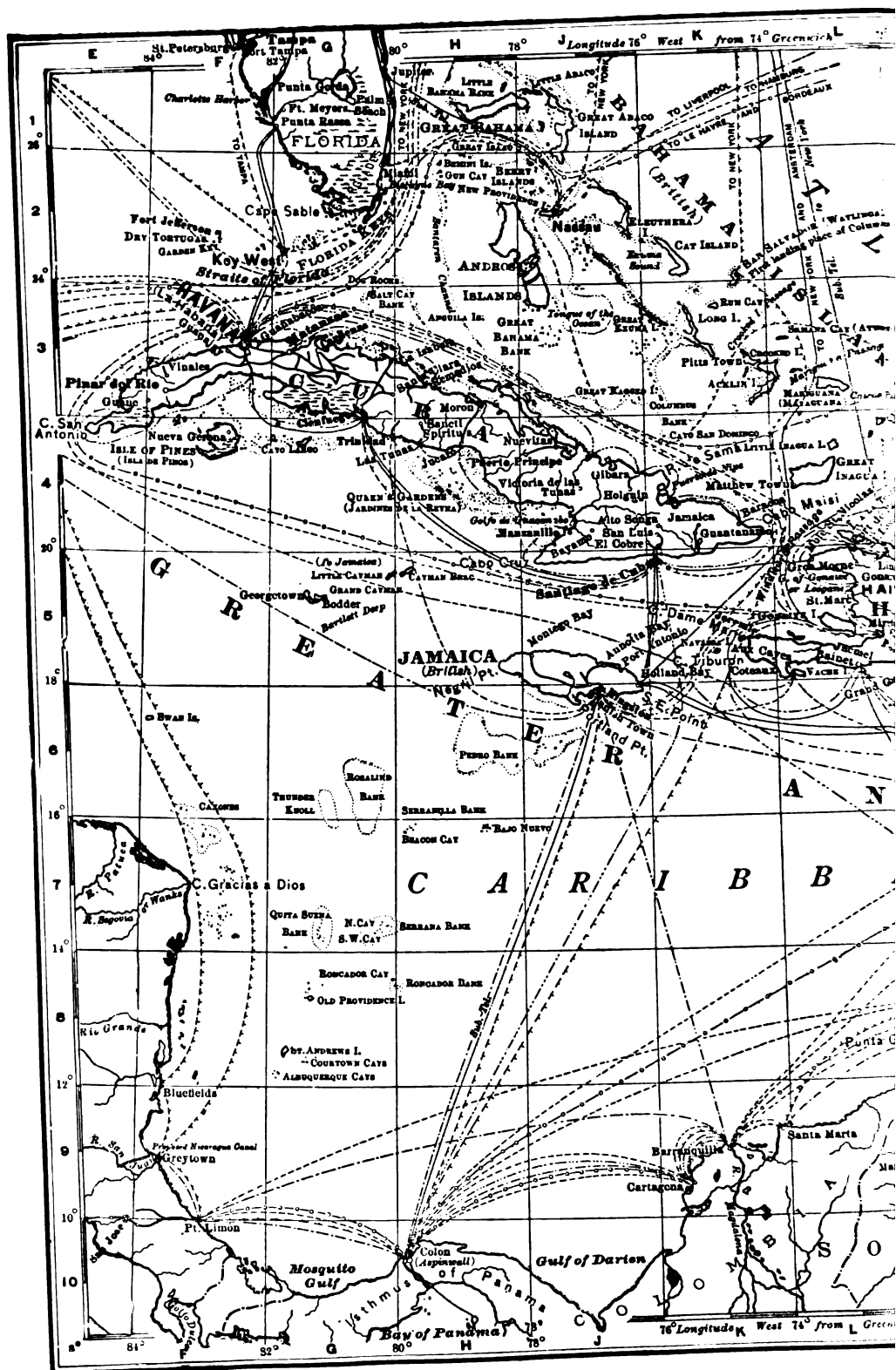
WEST INDIES, the name given to the archipelago lying between the Caribbean Sea and the Atlantic Ocean and extending from North to South America. The total area is estimated at upwards of 90,000 square miles, and the population at 5,000,000, of whom two-thirds are negroes, and a great part of the remainder mulattoes. The principal products include sugar, fruits, tobacco, maize, guava, ginger, and coconuts. The forests furnish valuable woods. The production of sugar was formerly of great importance, West Indian sugar being considered the finest in the world. The growth of the beet-sugar industry in Europe, however, and the granting of state subsidies for its encouragement, have brought it into competition with the West Indian cane-sugar industry, with disastrous results to the latter. Efforts have been made to remedy the evil, especially by the British government, which has appointed a commission for the purpose, but although new machinery and methods have been extensively introduced, there has been very little improvement in conditions. See **BAHAMAS**; **BARBADOS**; **CUBA**; **CURAÇAO**; **DANISH WEST INDIES**; **GUADELOUPE**; **HAITI**; **JAMAICA**; **LEEWARD ISLANDS**; **MARTINIQUE**; **PORTO RICO**; **SANTO DOMINGO**; **TRINIDAD**, and **WINDWARD ISLANDS**.

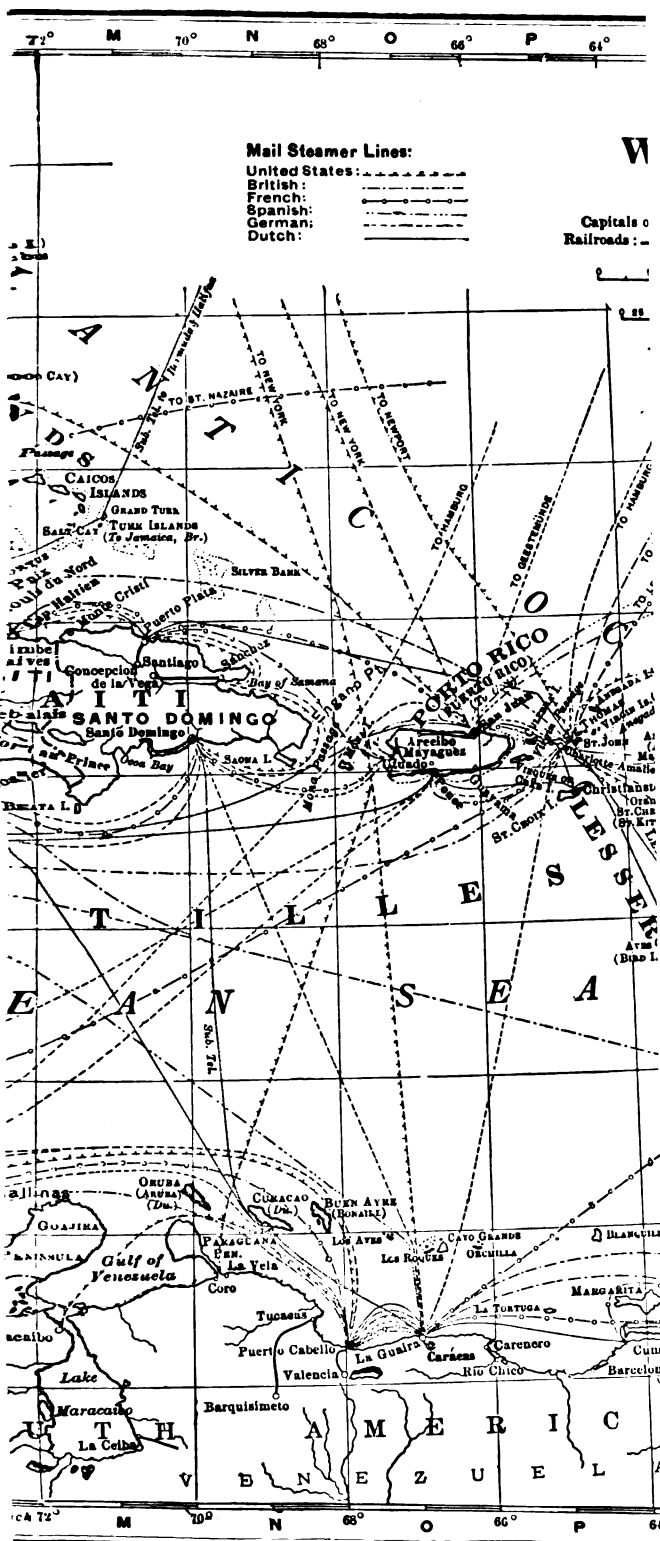
WEST POINT, **UNITED STATES MILITARY ACADEMY AT**. See **MILITARY ACADEMY, UNITED STATES**.

WEST VIRGINIA, a central eastern State of the United States, has an area of 24,780 square miles. The capital is Charleston. West Virginia became a State on June 20, 1863. The population in 1900 was 958,800, while in June, 1901, as estimated by the government actuary, it was 982,000. The largest city is Wheeling, with a population in 1900 of 38,878.

Finance.—The treasury receipts for the year ending September 30, 1901, were \$2,188,786.27; the expenditures were \$2,215,509.13. The receipts were made up of the State fund, \$1,672,644.39, and the total school fund, \$516,141.88. The chief sources of income were licenses, \$686,783; railroad taxes, \$78,041; land, \$295,023; personal property, \$101,376, and corporation taxes, \$240,000.

Industries.—Although West Virginia is an agricultural State, its manufactures have grown rapidly since 1880, their value in the decade between 1880 and 1890 increasing 69.2 per cent., and in the decade between 1890 and 1900, 91.7 per cent. In the latter year the actual capital, exclusive of capital stock, invested in the 4,415





manufacturing establishments reporting to the census enumerators was \$55,719,938; the gross value of manufactured products for the year was \$74,177,681, and their net value, deducting the value of products re-used in the process of manufacture, was \$47,697,646. The manufactures are largely located in the northern part of the State, along the Ohio River. Twelve counties along this river produce 59.3 per cent. of the total for the State, and four of them, situated within the narrow strip of territory between the Ohio River and Pennsylvania, produce 44 per cent. of the State's total industrial products. This extreme localization is partly due to abundant supplies of coal and gas, partly to the transportation facilities afforded by the Ohio River, and partly to the close proximity of the region to the Pennsylvania steel district. The iron and steel industry of West Virginia, confined to Wheeling and its vicinity, is the most important of the State. The output of this industry in 1900 was valued at \$16,574,212, an increase of 120.5 per cent. The manufacture of lumber and timber products, chiefly in the eastern part of the State, with Charleston as a shipping port, is the second important industry of the State, the product in 1900 being valued at \$10,612,837, as against \$5,097,772 in 1890. In the production of coke West Virginia was by 1899 second only to Pennsylvania, having increased the value of its product 300 per cent. in ten years, owing to the special suitability of its coal for coking purposes. Flour and grist milling produced \$5,541,353 in 1900; the tanning and currying of leather, \$3,210,753; car construction and railroad repair, \$2,943,557; glass manufactures, \$1,871,795, and planing-mill products, \$1,820,463. Wheeling, the principal manufacturing city, though producing in 1900 22.6 per cent. of the total value of the State's products, has not within the decade increased its manufacturing interests nearly so rapidly as the State at large, the rates of increase being respectively, as measured in values, 28.6 and 91.7 per cent.

Legislation.—Among the more important acts passed by the legislature in 1901 were the following: Street railway companies were directed to provide vestibules on all cars from November 1 to April 1, to protect their employees. The commissioner of labor was directed to establish, in connection with the bureau of labor, a free employment bureau for the purpose of receiving applications from persons seeking employment and from persons seeking to employ labor. Mercantile and manufacturing establishments were required to use all possible precautions against accidents and unsanitary conditions, and to provide seats for women employees which they might be permitted to use when not actively engaged in their duties. The license tax fee for domestic corporations, which had been previously fixed at the uniform rate of \$10, was placed upon a sliding scale, as follows: Domestic corporations with a capital of not more than \$10,000 were required to pay a tax of \$10, and corporations with larger capital were required to pay proportionately larger fees until the capital reached \$1,000,000, when the fee was to be \$70, with \$10 more for every added million of capital stock. Foreign corporations and corporations whose principal business was conducted outside of the State were to pay a license fee varying from \$20 on a capital stock of \$25,000 to \$410 for a capital stock of \$1,000,000, and an additional amount for every added million of capital stock. Constitutional amendments were directed to be submitted to the voters at the general election of 1902 as follows: (1) Providing that the secretary of state should thereafter be an elective officer instead of, as at present, an appointee of the governor; (2) providing that the legislature might increase the salaries of the principal executive officers over the present low rates provided in the constitution; (3) that the Supreme Court of Appeals should consist of five, instead of four, judges; (4) that the following clause in the constitution, "The legislature shall enact proper laws for the registration of all qualified voters in the State," should be excised, and in lieu thereof there should be inserted: "No citizen shall ever be denied or refused the right or privilege of voting at an election because his name is not or has not been registered or listed as a qualified voter." This proposed amendment is virtually identical with a clause in the Pennsylvania constitution respecting the registration of voters, which was annulled at the general election of 1901. (See PENNSYLVANIA.) Notwithstanding Virginia's many requests that West Virginia take up that part of the old Virginia debt which had been incurred before the organization of West Virginia as a separate State, the West Virginia legislature in 1901 passed resolutions on the subject as follows: "Resolved, That this legislature declines and refuses to take any action in regard to what is known as the Virginia debt, or Virginia deferred certificates, either by considering any proposition of adjustment for settlement, so-called, or by authorizing the appointment of any committee or committees having for their purpose the consideration of the same." "It is the sense of the legislature that the State of West Virginia is in no way obligated for the payment of any portion of the said debt, or certificates."

State Officers.—Governor, A. B. White, Republican, term four years, ending March 4, 1905; secretary of state, appointed, W. M. O. Dawson; treasurer, Peter Sillman; auditor, Arnold C. Scherr; attorney-general, B. H. Freer; superintendent of schools, T. C. Miller; commissioner of agriculture, J. O. Thompson; labor commis-

sioner, J. D. Barton. Supreme Court of Appeals—Chief justice in 1901, Henry Brannon; chief justice in 1902, M. H. Dent; associate justices, H. C. McWhorter, George Paffenbarger, and M. H. Dent (in 1901), and Henry Brannon (1902)—all Republicans except M. H. Dent.

Congressional Representatives (57th Congress).—In the House: Blackburn B. Dovener, from Wheeling; Alston G. Dayton, from Philippi; Joseph H. Gaines, from Charleston, and James A. Hughes, from Huntington—all Republicans. In the Senate: Nathan B. Scott (until 1905), from Wheeling, and Stephen B. Elkins (until 1907), from Elkins—both Republicans.

WHEAT. The wheat crop of the United States in 1901 was very large. According to the estimates of the *American Agriculturist* given below it exceeded even the great crop of 1898. The acreage and the yield in bushels are by that authority estimated as follows:

STATES.	Acres.	Yield per acre.	Total yield.	STATES.	Acres.	Yield per acre.	Total yield.
<i>Winter Wheat:</i>				<i>Spring Wheat:</i>			
New York.....	406,000	17.5	7,105,000	New England.....	9,000	18.5	167,000
Pennsylvania.....	1,375,000	18.4	25,300,000	Michigan.....	29,000	10.0	290,000
Texas.....	900,000	7.5	6,750,000	Illinois.....	90,000	12.0	1,080,000
Arkansas.....	228,000	9.0	2,052,000	Wisconsin.....	719,000	15.0	10,785,000
Tennessee.....	1,054,000	11.5	12,121,000	Minnesota.....	5,645,000	13.5	76,221,000
West Virginia.....	447,000	11.6	5,185,000	Iowa.....	1,120,000	16.3	18,256,000
Kentucky.....	850,000	11.2	10,640,000	Kansas.....	130,000	9.0	1,170,000
Ohio.....	2,290,000	15.5	35,600,000	Nebraska.....	1,150,000	9.2	10,580,000
Indiana.....	2,150,000	15.0	32,250,000	North Dakota.....	5,080,000	15.6	78,780,000
Wisconsin.....	195,000	17.0	3,315,000	South Dakota.....	3,500,000	10.9	38,150,000
Minnesota.....	104,000	15.0	1,560,000	California.....	98,000	13.0	1,274,000
Iowa.....	89,000	17.3	1,540,000	Oregon.....	958,000	21.0	20,118,000
Missouri.....	1,475,000	16.3	24,045,000	Washington.....	797,000	28.5	22,175,000
Kansas.....	5,145,000	19.2	98,808,000	Other States.....	843,000	15.0	12,645,000
Nebraska.....	1,320,000	20.0	26,400,000	Total.....	20,139,000	14.5	292,231,000
California.....	2,810,000	14.6	41,025,000	Grand total.....	49,175,000	15.3	752,811,000
Oregon.....	470,000	20.5	9,635,000				
Washington.....	354,000	25.0	8,850,000				
Oklahoma.....	1,181,000	18.4	21,730,000				
Other States.....	3,312,000	13.6	45,043,000				
Total.....	29,036,000	15.8	460,080,000				

For winter wheat the season was exceptionally good, except in Texas and Michigan, and in limited areas in the Ohio Valley, where the ravages of the Hessian fly were severe. High temperature and hot winds in July reduced the yield of spring wheat. The price of spring wheat No. 1 in Chicago in 1901 ranged from 63½ cents per bushel in July to 79½ cents in December. The world's wheat crop for 1901 is estimated at about 2,700,000,000 bushels, or over 100,000,000 bushels more than in 1900. Official estimates for some of the countries of Europe are as follows (in bushels): Russian empire, 427,780,266; France, 304,210,000; Italy, 147,560,400; Great Britain, 54,110,803; Germany, 91,817,031; Roumania, 72,386,435. The exports of wheat and wheat flour in 1900 and 1901, as estimated for the United States by Mr. F. H. Hitchcock, chief of section of foreign markets, United States Department of Agriculture, are as follows:

EXPORTS OF WHEAT FROM THE UNITED STATES.

COUNTRIES TO WHICH EXPORTED.	YEAR ENDING JUNE 30—			
	1900.		1901.	
	Bushels.	Value.	Bushels.	Value.
Great Britain.....	62,774,870	\$44,418,143	78,574,762	\$56,807,930
Netherlands.....	9,265,798	6,871,662	12,082,258	9,173,817
Belgium.....	8,475,650	6,230,917	11,024,534	8,319,612
Germany.....	9,065,713	6,495,209	10,267,622	7,871,573
Canada.....	2,673,154	1,937,293	7,066,662	5,197,655
Portugal.....	4,482,792	3,505,425	3,828,146	3,016,077
Portuguese Africa.....			1,627,891	964,937
France.....	1,237,247	990,965	1,139,525	871,237
Denmark.....	665,180	529,338	987,504	795,502
British Africa.....	1,407,994	990,475	1,021,810	746,817
Italy.....	461,553	369,056	925,946	675,478
Peru.....	228,179	135,366	980,418	608,955
Other countries.....	1,212,264	823,251	2,534,609	1,677,263
Total.....	101,950,389	\$73,237,080	132,080,667	\$96,771,743

EXPORTS OF WHEAT FLOUR FROM THE UNITED STATES.

COUNTRIES TO WHICH EXPORTED.	YEAR ENDING JUNE 30—			
	1900.		1901.	
	Barrels.	Value.	Barrels.	Value.
Great Britain.....	10,257,028	\$38,173,543	10,854,573	\$41,655,649
Netherlands.....	1,300,802	5,005,492	1,106,254	4,420,656
Hong Kong.....	1,410,584	4,208,623	1,322,527	3,868,458
Brazil.....	638,591	2,549,065	655,300	2,687,786
Cuba.....	573,012	2,047,652	556,556	2,060,129
Germany.....	691,782	2,700,638	602,933	2,011,259
British West Indies.....	566,606	1,977,784	525,203	1,889,575
Japan.....	538,405	1,554,799	354,887	1,035,893
Other countries.....	2,722,633	9,548,350	2,773,746	9,809,891
Total.....	18,699,194	\$67,760,886	18,650,979	\$69,459,296

WHIPPLE, HENRY BENJAMIN, Protestant Episcopal bishop of Minnesota, died at Faribault, Minn., September 16, 1901. He was born at Adams, N. Y., February 15, 1822. He studied theology and became a priest in 1850. His first charge was at Rome, N. Y. (1849), from which he was sent to the Church of the Holy Communion at Chicago in 1857, and two years later he was consecrated first bishop of Minnesota. In 1860 he assisted in organizing the Bishop Seabury Mission, from which developed the Cathedral of Our Merciful Saviour, the Seabury Divinity School, Shattuck School, and St. Mary's Hall, which have made Faribault one of the centres of educational work in the Northwest. Bishop Whipple's greatest work was among the Indians, and he earned by his strict honesty of dealing the title of "Straight Tongue" among the northwestern tribes. To the cause of negro education in the South Bishop Whipple gave his active support, serving for many years as a trustee of the Peabody Educational Fund. The degree of LL.D. was conferred upon him by Cambridge University and that of D.D. by Oxford. He wrote: *Sermons and Addresses; Lights and Shadows of a Long Episcopate*, and much on Indian affairs.

WHIST. The principal interest in whist in 1901 was in the rapid spread of bridge whist as a social pastime. A journal devoted to the game and entitled *Whist* is published in Milwaukee. Mr. Ernest B. Cooper, of Shelbyville, Tenn., continues as the corresponding secretary of the American Whist League.

WHITE, STEPHEN MALLORY, ex-senator from California, died at Los Angeles, February 21, 1901. He was born in San Francisco, January 19, 1853, and graduated at Santa Clara College, in his native State, in 1871. He was admitted to the bar in 1874 and became active in State politics, being district attorney (1882-86), senator and president *pro tempore* of the senate (1886-90), and during 1888-90 acting lieutenant-governor. In 1893 he became a United States Senator, and served one term. Senator White, with his large legal experience and skill in debate, became prominent in all measures of national legislation.

WHITMAN, WILLIAM EDWARD SEAVER, American journalist, died at Augusta, Me., September 28, 1901. He was born at South Boston, Mass., December 25, 1832. After studying law he went into newspaper work, and, writing under the pen name of "Toby Candor," was employed for twenty-five years on the Boston Journal. In 1869-70 he was editor and proprietor of the *Daily Times* and weekly *American Sentinel*, of Bath, Me. He wrote: *The Ship Carpenter's Family*, a novel; *Maine in the War for the Union*; a history of *Narrow Gauge Railroads*; and *Wealth and Industry of Maine*.

WIGGER, Right Rev. WINAND MICHAEL, Roman Catholic bishop of Newark, N. J., died at Orange, N. J., January 6, 1901. He was born in New York City, December 9, 1841, and in 1861 graduated at the College of St. Francis Xavier there. After two years spent at the Theological Seminary of Seton Hall College, in New Jersey, he completed his theological studies at the College of Brignole Sale, Genoa. He was ordained to the priesthood at Genoa in 1865 and returned to the United States in the same year. He was connected with the Cathedral at Newark until 1869, and thereafter was rector of various parishes in New Jersey until 1881, when he was chosen to succeed Archbishop Corrigan as bishop of Newark, an important diocese, comprising the entire northern half of the State.

WILDMAN, ROUNSEVILLE, United States consul-general at Hong Kong, died at San Francisco, February 22, 1901. He was born at Batavia, N. Y., March 19, 1864, and graduated at Syracuse University. He was engaged in reportorial work in New York, Chicago, and Kansas City, and later became editor of the *Idaho Statesman*. In 1889 he was appointed consul at Singapore by President Harrison, and in 1893 was transferred to Barmen, Germany, but was recalled in the same year by President Cleveland. He then became commissioner at the Columbian Exposition for the

Straits Settlements and Borneo. For three years (1894-97) he was editor and proprietor of the *Overland Monthly*, resigning his editorship in the latter year to become consul at Hong Kong, and in 1898 he was raised to the rank of consul-general. While consul at Singapore Mr. Wildman was a special commissioner of the Smithsonian Institution for the Straits Settlements and Siam, and for similar services for the British government he was chosen a member of the Royal Asiatic Society. During the Spanish-American War (1898), the Filipino insurrection in 1899 and 1900, and in the outbreaks in China in 1900, he skillfully met difficult questions, and was of great service to American interests in Hong Kong. While on his way home on leave, he, with his wife and family, was drowned in San Francisco harbor in the sinking of the steamer *Rio de Janeiro*.

WILLES, Sir GEORGE OMMANEY, British admiral, died in London, February 18, 1901. He was born at Hythe, Hants, in June, 1823. He entered the navy in 1837, served in the Crimean War (1854-55), in China (1859-60), and in 1870-74 was naval aide-de-camp to Victoria, and chief of staff (1869-72) to the board of admiralty. He was commander-in-chief of the China station in 1881-84, and at Portsmouth in 1885-88, being in charge of the naval manœuvres at the Victoria jubilee, 1887. In 1879 he was made vice-admiral, admiral in 1885, and was retired in 1888.

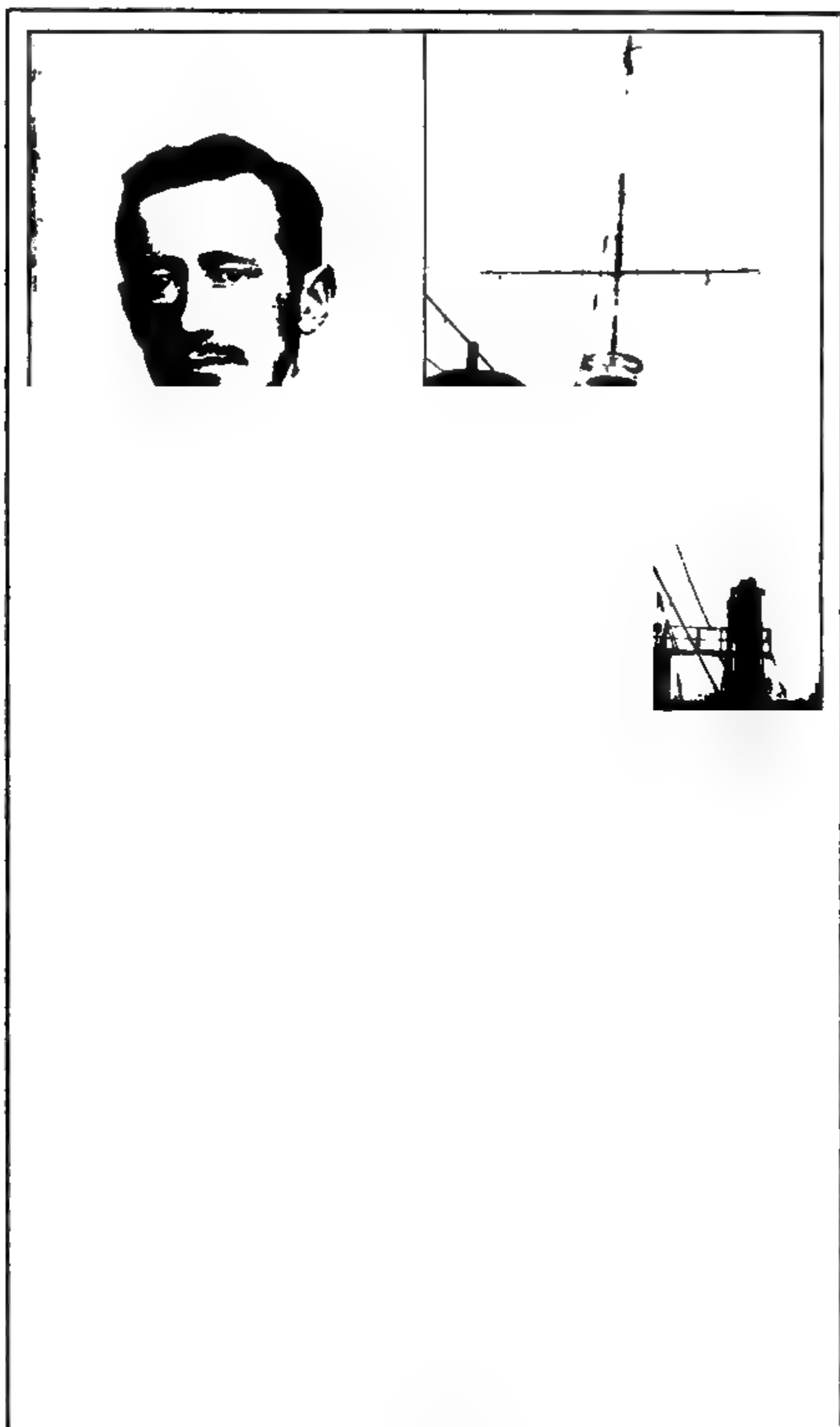
WILLIAMS, ROBERT, brigadier-general, U.S.A. (retired), died at Plainfield, N. J., August 24, 1901. He was born in Virginia, November 5, 1829, and graduated at West Point in 1852. He took part in the Civil War, fighting at the battle of Antietam as colonel of the First Massachusetts Cavalry. Serving as assistant adjutant-general in various departments after the war, he was made in 1892 adjutant-general of the army. He was brevetted brigadier-general in 1865, was made lieutenant-colonel in 1869, colonel in 1881, and brigadier-general in 1892, and was retired from active service in 1893.

WILLIAMS COLLEGE, Williamstown, Mass., founded 1793. During the academic year 1900-01, the faculty consisted of 36 professors and instructors, and the student body of 390, of whom 35 were graduate students. The library contains 47,300 volumes, and over 17,000 pamphlets. In its maintenance and enlargement about \$4,500 are expended annually. At the present time there is an income on scholarship endowments amounting to \$11,000 annually. For their new president, to succeed Dr. Franklin Carter, the trustees have chosen Rev. Henry Hopkins, D.D., son of President Mark Hopkins, who in his work at Williams left the impress of his character upon college life throughout the United States.

WILMOT, Sir HENRY, British soldier and member of Parliament, died at Bournemouth, England., April 7, 1901. He was born in Derbyshire, England, February 3, 1831, and was educated at Rugby. He entered the army and served during the Indian mutiny. He received the Victoria Cross for gallantry at Lucknow in 1858. He served as deputy judge-advocate of the Oudh Field Force (1857) and judge-advocate-general to the forces in the Chinese War (1860-61); and from 1869 to 1885 he represented South Derbyshire as a Conservative in Parliament.

WINDMILLS. An important monograph on this subject, entitled *The Windmill: Its Efficiency and Economic Use*, was issued in 1901 as No. 41 of the *Water Supply and Irrigation Papers* of the United States Geological Survey. Mr. Edward C. Murphy is the author of this monograph, which is a revision and extension of a similar study by him, printed in the same series in 1897. The present work gives a brief history of windmills, classifies them, describes those now in use, reviews previous experiments on their efficiency, and gives the results of a series of experiments by the author. Mr. Murphy believes that a good 12-foot steel windmill should give 1 horse-power in a wind blowing 20 miles per hour, and 1.4 horse-power in a 25-mile wind. This, he says, "is the smallest amount of power that will do any considerable amount of useful work." Most pumping mills, with their supporting towers, are too light. Mills should be placed at least 30 feet above surrounding trees and buildings, should readily be governed, and start in light wind.

WINDWARD ISLANDS, the most southerly of the West Indian Islands, form a British dependency comprising the three colonies of Grenada, St. Lucia, and St. Vincent, and the group known as the Grenadines, which is divided for administrative purposes between Grenada and St. Vincent. Barbados (*q.v.*), a separate colony with its own governor, and Tobago, attached to Trinidad (*q.v.*), form part of the Windward Islands geographically, but are not included in its colonial organization. The total area of the colony is 524 square miles, and the aggregate population (1901) 160,884. St. George, the chief town of Grenada, with a population of 5,000, is the seat of government. There is one governor for the three colonies and a common court of appeals (with Barbados), but there is no federal legislature, as in the Leeward Islands, nor is there a common tariff or treasury. The aggregate revenue of the three divisions was £172,450 in 1900, and the expenditures £171,300. In the same year the imports and exports were £613,420 and £399,820 respectively, and there



WIRELESS TELEGRAPHY ON SHIPBOARD.—William Marconi, Instrument Room, and Wires on the Yacht *Hohenzollern*

2

was a combined public debt of £330,560 for the most part contracted for public works.

Grenada, the most populous island, lies 96 miles to the north of Trinidad, and has an area of 133 square miles and a population, including some of the Grenadines, of 63,438 (1901). The revenue of the island has steadily increased from £56,973 in 1897 to £70,363 in 1900. The expenditure in 1900 was £62,718, and there was a public debt of £127,570. The imports for 1900 were £232,790 and the exports £311,681, the latter showing a decided increase over 1899, when the figures were £267,738. The largest item of export in 1900 was cacao, which was valued at £269,931. Other exports were nutmegs and spices.

St. Lucia, the largest of the Windward Island group, lying 21 miles southeast of Martinique, has an area of 233 square miles and a population of 49,895 (1900). The chief town is Castries, with 8,000 inhabitants. The imports (1899) were £282,963 and the exports, of which one-quarter was sugar, were £170,668, a slight increase over the preceding year. On *St. Lucia* alone, of all the British West Indies, the central factory system of sugar growing has been inaugurated, and the results for 1900 were reported as being particularly satisfactory.

St. Vincent, which lies 95 miles west of Barbados, has an area of 132 square miles and a population of 44,633, of whom about 32,000 are blacks. Its imports in 1899 were £103,627, and its exports, consisting largely of sugar, coffee, spices, and rum, were £33,510, a decided decrease since the year 1897, when they amounted to £68,935.

WIRELESS TELEGRAPHY. The most notable event in the field of wireless telegraphy during 1901 was the transmission of signals across the Atlantic Ocean between Poldhu, Cornwall, and St. Johns, Newfoundland, on December 11. These signals were transmitted by the Marconi apparatus, the distance traversed by them being 1,800 miles. The account of the experiment given by Mr. Marconi was substantially as follows: At Poldhu there was a transmitting apparatus and at St. Johns there was a receiving apparatus. On December 9 Mr. Marconi, at St. Johns, cabled his operator at Poldhu to transmit daily between the hours of 3 P.M. and 6 P.M. the letter S in the Morse code at certain intervals. On December 11 these signals were faintly received at St. Johns, and on December 12 they were received again. The success of the experiment was then announced by the inventor.

Marconi has found from his experiments that all that is necessary to transmit signals over considerable distances is abundant electrical power to generate the waves, and that the curvature of the earth does not seriously affect their transmission. It is, however, necessary to consider the geological formation of the ground near the station, as the presence of iron deposits exerts a most injurious effect on the receiving of signals, while other conditions will either benefit or retard the working of the apparatus. During the year Mr. Marconi has been engaged in perfecting the syntonizing of his apparatus, so that one set of instruments will not be affected by other signals. This has been accomplished, and the methods were described by the inventor in a paper read before the Society of Arts of London, May 15, 1901.

In Belgium, M. E. Guarini has devised automatic repeaters which receive a series of signals and then repeat or transmit them to stations beyond. In Germany, Professor Slaby and Count Arco have further improved their system, and it is being used practically. In Russia, M. Popoff has been active, and his apparatus has been used extensively in the naval and military services, and for communicating with the ice-breaking steamer *Ermack*. In France, M. Ducretet has been actively at work, and modifications of the Popoff and other systems have been used in elaborate experiments. In the United States, both the signal corps of the army and the weather bureau have carried on investigations which have dealt with the testing of existing systems and new methods, rather than with work of marked originality. In San Francisco harbor the signal corps maintains a system of wireless telegraphy, but as yet no syntonizing devices have been introduced and the line lacks speed as compared with a submarine cable. The work of the weather bureau has been mainly experimental, and the new devices invented by various European experimenters have been tried, and also original methods of the various investigators connected with the bureau. Experimental stations have been in operation during the year between the mainland and islands on the Atlantic coast in North Carolina and Virginia, and apparatus was in readiness for installation in the Farallone Islands and the Talooosh Islands and the mainland on the Pacific coast.

There were great advances during 1901 in the commercial application of wireless telegraphy. In October a contract was made between the Marconi International Communication Company, Limited, and the Lloyds of England, whereby the latter association agrees to use the Marconi system exclusively for a term of fourteen years. Ten stations were soon put in operation, one of which is located at Fastnet, two on the Red Sea, and others at convenient locations, while the eight Marconi stations then maintained on the British coast were to be taken over. Under this arrangement, not only will intelligence of approaching vessels be communicated to the

owners and others, but communication will be maintained between the land and such persons on board as desire to transmit messages. Commercial stations were in operation during 1901 between islands of the Hawaiian group, and also between islands and the mainland in the Mediterranean Sea. An important practical application, though not over extremes of distance, was made in October when the International yacht races off New York were reported for various newspapers and press associations by wireless telegraphy. For the Associated Press the Marconi system was operated with considerable success, while two other companies were in the field with apparatus of their own. In the case of two of the companies, the time was divided, so that the transmission of signals was free from any interference caused by the simultaneous sending out of electric waves, but their work was interfered with by the third party to a greater or less extent. It is needless, of course, to say that this apparatus was not syntonized or arranged so as to be free from interference by other sets of waves.

Wireless telegraphy is playing an important part in naval equipment, and all leading nations of the world are conducting extensive experiments and testing the claims of rival systems. In the merchant marine, also, particularly with the great trans-Atlantic liners, there has been a considerable use of the system, and at the end of the year it was announced that apparatus for wireless telegraphy was installed in permanent form on some 70 ships. Of these, 37 were in the British navy, 12 in the Italian navy, and the others on vessels of the Cunard, North German Lloyd, Beaver, and other lines. Twenty land stations were maintained in Great Britain, and with these the trans-Atlantic vessels have been communicating regularly for some months. All ships except naval vessels have their apparatus adjusted so that all signals will be received, and thus are able to discover the proximity of vessels in the vicinity, render aid, avoid danger or give warning, as may be desired. In conclusion, it may be said that no less progress has been made in the commercial application of wireless telegraphy than on its theoretical and experimental side, and companies for long-distance wireless communication are being considered as financial propositions in several instances.

WISCONSIN, a northern lake State of the United States, has an area of 56,040 square miles. The capital is Madison. Wisconsin was organized as a Territory July 3, 1836, and admitted as a State May 29, 1848. The population in 1900 was 2,069,042, while in June, 1901, as estimated by the government actuary, it was 2,110,000. The populations of the five largest cities in 1900 were: Milwaukee, 285,315; Superior, 31,091; Racine, 29,102; La Crosse, 28,895, and Oshkosh, 28,284.

Industries.—From the census returns it appears that there has been a notable growth in the manufacturing and mechanical industries of Wisconsin during the last half century. Since 1850 the population has increased from 305,391 to 2,069,042, while the average number of industrial wage-earners has increased from 6,089 to 142,076, embracing in 1900 6.9 per cent. of the entire population, as against 2 per cent. in 1850. In 1900 there was invested in the 16,187 mechanical industries reporting a capital, exclusive of capital stock, of \$330,568,779; at the same time the gross value of the products was \$360,818,942, while the net value of the products, exclusive of materials re-used in the process of manufacture, was \$245,725,227. The manufacture of lumber and timber products is the most important industry of the State, having products in 1900 valued at \$57,634,816, or 16 per cent. of the total value of the products of the State. Although since 1890 this industry has decreased by \$3,331,628, or 5.5 per cent., Wisconsin in 1900 stood first among the States in the value of its lumber and timber products. The manufacture of flouring and grist mill products ranked second among the industries of the State in 1900, having products valued at \$26,327,048, showing an increase during the decade of \$2,075,645, or 8.6 per cent. Although the Wisconsin wheat crop is large, amounting in 1899 to 11,773,332 bushels, yet much of the wheat used in the mills is imported, 22,356,963 bushels being used by the mills in 1899. Foundry and machine-shop products in 1900 were valued at \$22,252,730, showing a very large increase since 1890 of \$13,785,440, or 162.8 per cent. The products of this industry include machinery for motor power, principally gas and steam engines and boilers, and for the equipment of lumber, flour, and paper mills, breweries, and mines. Manufactures of cheese, butter, and condensed milk in 1900 had products valued at \$20,120,147. The increase since 1890 was \$13,159,436, or 189.1 per cent. In 1890 the State was fourth in the Union in this industry, while in 1900 it was second. The tanning, currying, and finishing of leather in 1900 had products valued at \$20,074,373. The abundance of tan-bark, the result of the extensive lumber supplies in the State, has contributed much to the growth of this industry, the increase since 1890 being \$8,912,523, or 79.8 per cent. Manufactures of malt liquors in 1900 were valued at \$19,394,709, showing an increase since 1890 of \$5,201,652, or 36.6 per cent. Wisconsin at present ranks fourth in the Union in the malt liquor industry, Milwaukee continuing to be the principal centre of this industry in the State. Slaughtering and meat packing had products in 1900 valued at \$13,601,125.

The manufacture of paper and wood pulp had products valued at \$10,895,576, showing an increase since 1890 of \$6,420,208, or 143.5 per cent. The mills for this industry are situated mainly on the large rivers, and the large quantities of spruce, hemlock, and other woods furnish abundant raw material. Iron and steel manufactures in 1900 had products valued at \$8,905,226. An industry which has been rapidly growing is that of the manufacture of furniture, which in 1900 had products valued at \$8,721,823, showing an increase from 1890 of \$5,105,306, or 141.2 per cent. Closely allied to this industry is the manufacture of planing-mill products, whose output in 1900 was valued at \$8,400,695. The proximity of Wisconsin to the principal grain growing States is largely responsible for the increase in the manufacture of agricultural implements, which were valued in 1900 at \$7,886,363. Other industries in 1900 were as follows: Carriage and wagon manufactures, valued at \$6,956,341; car construction and general railroad shop work, with products valued at \$6,306,823; manufactures of tobacco, valued at \$4,888,030; manufactures of boots and shoes, valued at \$4,791,684; manufactures of men's clothing, valued at \$4,393,092; and the manufacture of textiles, valued at \$4,238,342.

Labor Laws.—Among the more important labor laws passed by the Wisconsin Legislature were the following: Provision was made for the establishment of a free public employment bureau in every city of 30,000 or over, and private employment bureaus in such cities were to be required to pay an annual license fee of \$100. The commissioner of the bureau of labor was directed to appoint superintendents for each of the free labor bureaus established, and the superintendents were to be required to make returns to the commissioner of the number of applications received and of the number of unemployed men who had been given employment; and if the superintendent was shown to be inefficient by the small number of men for whom he had obtained employment, he was to be discharged. It was also made the duty of each superintendent "to put himself in communication with the principal manufacturers, merchants, and other employers of labor, and to use all diligence in securing their cooperation." At the same time it was provided that no list of applicants should be given or shown to any employer whose own employees were on strike or locked out. Another labor law provided that no room in a tenement or dwelling house should be used for manufacturing or industrial purposes without a certificate granted by the commissioner of labor, and such certificate should not be granted unless the rooms were in a proper hygienic condition, and certificates might be revoked for cause at any time. A resolution passed by the legislature regarding prison industries requested the board of control of the State penitentiary to make experiments with some small industries in the State prison and State reformatory; to investigate the system of prison labor in vogue in other States, and to report to the legislature some plan for diversifying the prison industries so as to do away with any unjust competition with honest labor due to the employment of too great a number of the prison inmates in any one line of manufacture.

Proposed Constitutional Amendments.—The following amendments to the constitution having passed the legislature of 1899, and also that of 1901, were directed to be submitted to the electors for ratification at the general election, November, 1902: (1) To no office-holder or candidate for office of State, county, or town shall be given free railroad or transportation passes; and if he does receive such passes, it shall be construed as bribery; and if a member of the legislature accepts such passes his seat shall be declared vacant. (2) "The legislature shall have power to enact a general banking law for the creation of banks and for the regulation and supervision of the banking business, provided that the vote of two-thirds of all the members elected to each house be in favor of the passage of such a law." The following amendments were proposed by the legislature of 1901, but must also be approved by the legislature of 1903 before they are submitted to the voters for ratification: (1) Providing that the Supreme Court shall consist of seven judges instead of five, as at present, and that their term of office shall be fixed at ten years instead of, as at present, being determined by the legislature. (2) Amending that provision of the constitution which reads, "The legislature shall establish but one system of town and county government, which shall be as nearly uniform as practicable," by adding the proviso that "in counties which contain an incorporated city of more than 100,000 inhabitants, the legislature may establish a separate system of county government."

Other Legislation.—By a bill approved by the governor on May 16, 1901, the legislature declared, (1) That the ice on all surveyed lakes in the State is State property, and (2) that all ice cut from those lakes and exported from the State shall pay a license fee of 10 cents a ton. Nearly two-thirds of the ice used in Chicago has hitherto been cut from Wisconsin lakes, and the measure is taken to mean that the wholesale price of ice in Chicago will be increased 10 cents a ton. Notwithstanding the provision of the Federal Constitution that no export duty shall be laid on goods transported from one State to another, the governor of Wisconsin accompanied his approval of the Ice-tax Bill by a statement maintaining its constitutionality on the

ground that the ice taxed was the property of the State and the tax was not in the nature of an export tax, but was in the nature of a price charged for the sale of the ice. A divorce law passed decreed that no person divorced in the courts of the State should within a year from the time of the divorce marry again without the permission of some court of record. An act lowering the tax on vessel property fixed the tax rate for this kind of property at 3 cents per ton in lieu of all other taxes. Previously vessel property was taxed in Wisconsin on the same basis as other property, with the result that many vessel owners sought registration in Minnesota, where the tax rate was 3 cents a ton. Taxes on domestic life insurance companies were changed from 1 per cent. of the gross premium, wherever collected, to 3 per cent. of the premiums collected in Wisconsin. The use of the United States flag for advertising purposes was prohibited. An educational act provided for the preparation of a course of study in district schools in the elements of agriculture, for courses of study in agriculture and domestic economy in secondary schools in the rural districts, and for courses of study in manual training and domestic economy in graded schools. Another educational act authorized the educational board of every city to provide for free evening lectures on the natural sciences and other educational topics. The compulsory school age was raised from 13 to 14 years. An act was passed authorizing the use of voting machines. Congress was petitioned to pass the Grout bill taxing oleomargarine, pending in Congress. The resolution stated that the Wisconsin laws prohibited oleomargarine when made to imitate butter, but that the laws were evaded; that imitation butter was being constantly forced on Wisconsin to the detriment of her dairymen, and for that reason Wisconsin believed that a uniform law should be enacted by Congress applicable throughout the United States and enforceable by Federal authority.

Primary Bill.—Great efforts were made in Wisconsin in 1901 by Governor La Follette to secure the enactment by the legislature of a primary election law. The matter of primary elections had been agitated in the State for four years, and the movement for it had become so strong that the Democratic State platform in 1898 and the Republican in 1900 had adopted without qualification the principle of the nomination of all candidates, State, county, and municipal, by direct vote of the people at primary elections. In accordance with these pledges, a bill was presented in the Republican legislature of 1901 abolishing all caucuses and conventions, substituting direct nominations, and permitting nominations by petition. A ballot on which electors could vote for non-partisan nominations was also provided for, and it was directed that party ballots should be in the Australian form. The expenses of primaries were to be a charge on the State. The house, after a stubborn contest, passed this bill by a vote of 51 to 48, but the senate refused to concur in it. As stated by Governor La Follette, there then began a wholesale system of lobbying and bribery to insure the defeat of the bill. "An army of Federal office-holders, joining with certain corporation agents and the representative of the machine in the regular legislative lobby, moved upon the Capitol, took possession of its corridors, intruded into the legislative halls, followed members to their hotels, tempted many with alluring forms of vice, and in some instances brought them into the Capitol in a state of intoxication to vote against the bill." The original bill was beaten in the senate, and it was then proposed, as a compromise, by the friends of a primary measure that the system be limited to municipal and county offices. This was likewise rejected by the senate, and the bill was finally passed limiting the direct primary to county officials and making its employment even there optional. Governor La Follette promptly vetoed the bill, not only on the ground that it was a direct repudiation of solemn platform pledges, but on the further ground that even the modified bill was void on account of the numerous inconsistencies which had apparently been inserted into it by design, so as to render its practical working impossible. The senate, promptly upon receipt of the governor's veto, passed a resolution declaring that he had insulted a highly honorable body. No further primary bill was passed. Many believe that the struggle between the governor and the legislature means the actual disruption of the Republican party. A Republican majority of over 100,000 is a good deal to overcome, but Democrats point to the fact that they carried the State in a national election no longer ago than 1892. The great struggle will come in the Republican State convention in the summer of 1902, when the opponents of the primary election law will marshal their forces to prevent the renomination of Governor La Follette, who has stood for years as the leader in the fight against machine rule.

State Officers.—Governor, term ending January 5, 1903, Robert M. La Follette, Republican; lieutenant-governor, Jesse Stone; secretary of state and auditor, W. H. Froehlich; treasurer, James O. Davidson; attorney-general, E. R. Hicks; superintendent of education, L. D. Harvey; insurance commissioner, Emil Giljohann; commissioner of railroads, G. L. Rice. Supreme Court—Chief justice, John B. Casaday, Republican; associate justices, John B. Winslow, Democrat; C. V. Bardeen, Republican; J. E. Dodge, Democrat; and Roujet D. Marshall, Republican.

Congressional Representatives (57th Congress).—In the House: Henry A. Cooper, from Racine; Herman B. Dahle, from Mount Horeb; Joseph W. Babcock, from Necedah; Theobald Otjen, from Milwaukee; Samuel S. Barney, from West Bend; James H. Davidson, from Oshkosh; John J. Esch, from La Crosse; Edward S. Minor, from Sturgeon Bay; Webster F. Brown, from Rhinelander, and John J. Jenkins, from Chippewa Falls—all Republicans. In the Senate: John C. Spooner (until 1903), from Madison, and Joseph V. Quarles (until 1905), from Milwaukee—both Republicans.

WISCONSIN, UNIVERSITY OF, Madison, Wis., organized 1848. The most important collegiate event of 1901 was the resignation of President Charles Kendall Adams, who had been absent in Europe on leave, made necessary by ill health. Upon returning, he found himself unable to continue his duties, and resigned the presidency October 11, after a continuous service of 10 years. His administration has been marked by a great advance of the university in numbers, resources both material and intellectual, and by even greater progress in the standards and spirit of the institution. Professor E. U. Biege is acting president. During the year the School of Commerce in the university began its work under the directorship of Professor W. A. Scott. The Historical Society's building, built at a cost of \$625,000, was completed. This building stands on the university campus and is occupied by the society and the university jointly. The legislature of 1901 made an appropriation of \$5,000 annually for the purchase of books for this library. The university library proper received an addition of over 5,000 volumes during the year, giving it now a total of 75,000 volumes. The university also received from the State \$150,000 for a building for the College of Agriculture, \$30,000 for equipment in the College of Engineering, and an addition of \$11,000 to the permanent annual income received from the State, most of which is to be devoted to the newly established College of Commerce. The number of students for the year 1900-01 was 2,619, an increase of 197 over the preceding year.

WOMAN'S CHRISTIAN TEMPERANCE UNION, NATIONAL, organized at Cleveland, O., November, 1874, had in 1901 about 10,000 local unions in the United States, with a reported active membership of 157,030. Including the members of children's societies and persons allied with the Union, the total membership is placed at about half a million. During 1901 several important movements supported by the W. C. T. U. were successfully carried out. Among these were: The repeal of the law authorizing the sale of liquor in army canteens; the prohibition of the sale of liquor to natives in the Pacific islands; the prohibition of the regulation of prostitution by the military authorities in the Philippines; and legislation enacted in nearly every State in the interest of temperance and purity. President, Mrs. M. N. Stevens, Maine; corresponding secretary, Mrs. Susanna M. D. Fry; headquarters, Rest Cottage, Evanston, Ill. See KANSAS (paragraph Liquor Law); NATION, Mrs. CARRIE; and UNITED STATES (paragraph Army Canteen).

WOOL AND WOOLLEN MANUFACTURE. The condition of the wool industry during 1901 was favorable, and in contrast to the dullness characterizing the previous year. There was an increase in production, as may be seen from the tables accompanying this article, but at the same time there was a decrease in imports and an active demand for wool of all grades. As a result, the large quantity of wool on hand in the United States on December 31, 1901 (177,191,000 pounds, or, including the amount in bond, 212,203,036 pounds), was considerably less than that on December 31, 1900 (294,537,338 pounds, or, including the amount in bond, 352,247,369 pounds). In explanation of this statement it may be said that the stock of wool, which in 1900 was kept back from the market by the growers, in 1901 was placed early on sale, with corresponding benefit to the producer, and there has been a more immediate connection between the grower and the manufacturer than previously. The sources of wool production in the United States and the statistics by States are given at length in the table. The figures for the total number of sheep are for the spring shearing of 1901, and show an increase over those of 1900 of 2,522,215. The yield of wool, exclusive of pulled wool, by which is meant the wool taken from slaughtered animals, shows an increase of 23,074,218 pounds, which is most marked in the northwestern States, especially Montana, Wyoming, and Oregon. Texas, which is one of the largest wool-growing States, shows, on the other hand, a considerable decrease. It is estimated that the average shrinkage of wool, on being scoured, is 60 per cent., and in the case of pulled wool 33 per cent., so that of the total product of 1901, 321,189,533 pounds, there would remain of scoured wool, 138,774,288 pounds, as compared with 121,490,975 pounds in 1900. As regards sales of wool, the year 1901 was marked by heavy business and slight fluctuations in the price, the market being mainly in the hands of the consumers rather than speculative interests. The demand for wool has been large, as the mills have been producing goods in which wool entered more largely, and consequently cotton and shoddy have been used to a less extent than before. Notwithstanding this, there was a bill introduced in

Congress providing for the Federal inspection of woollen goods and shoddy, and for the proper stamping of the same. All hair, wool waste, rag fibres, etc., used with wool should be classed as shoddy, and all clothing or other material made from goods of which it is a part must be so labeled, under penalty of a heavy fine. This bill, however, was regarded as an extreme measure put forward by certain narrow-minded woolgrowers, and not likely to pass. With the diminution of sheep in the eastern States, there has been an increase in western flocks, and with this increase there has been a marked improvement in the western wools, certain of which are beginning to approach the Australian wool. It is noted by buyers, however, a fault which is common in many American industries, that the wool is often not well put up for market.

The woollen mills during 1901 were running at full capacity, and in many instances were working both night and day. The most profitable business was done in plain fabrics, for which there was an active demand throughout the year. The business was steady and said to be profitable, especially for those mills with improved and modern equipment. There were 81 new woollen mills constructed during the year, as compared with 43 in 1900. Of these new mills, 10 were erected in Rhode Island in the last six months of 1901. Others were constructed in New York, Connecticut, Massachusetts, New Jersey, California, Colorado, and Pennsylvania.

In the following table are shown the imports and exports of wool in the United States for the past 11 fiscal years:

	Imports. Pounds.	Exports. Pounds.
1890-91.....	129,303,648	2,930,045
1891-92.....	148,670,652	3,210,019
1892-93.....	172,433,838	4,310,495
1893-94.....	55,152,585	6,497,654
1894-95.....	206,081,896	6,622,190
1895-96.....	230,911,473	12,972,217
1896-97.....	350,852,026	8,700,598
1897-98.....	132,795,362	2,625,971
1898-99.....	76,736,209	14,095,335
1899-1900.....	155,928,455	7,912,557
1900-01.....	103,583,505	3,790,067

The decrease in the imports in 1901 from those in 1900, which were the greatest since the passage of the Dingley bill, was caused by a decline in the importation of third-class or carpet wools.

WOOL PRODUCTION OF UNITED STATES 1901 AND 1900.
(From statistics in *American Wool and Cotton Reporter*.)

STATES.	1901.			1900.	
	Number of Sheep.	Weight per fleece.	Clip (lbs.)	Number of Sheep.	Clip (lbs.)
Maine.....	236,496	6.5	1,587,217	247,168	1,483,008
New Hampshire.....	48,306	8.5	410,801	76,383	496,490
Vermont.....	142,506	8.1	1,154,299	164,858	1,112,792
Massachusetts.....	35,610	7.0	249,270	39,632	237,792
Rhode Island.....	10,816	5.0	54,060	10,364	57,002
Connecticut.....	33,817	6.5	219,800	31,204	171,662
New York.....	754,666	6	4,527,996	819,088	4,914,528
New Jersey.....	40,515	4.7	190,420	41,654	208,270
Pennsylvania.....	763,242	5.8	4,426,804	777,677	4,666,062
Delaware.....	14,200	5.00	71,000	12,239	61,198
Maryland.....	125,017	5.2	650,088	133,341	666,708
Virginia.....	362,490	4.3	1,568,707	358,072	1,790,260
North Carolina.....	232,413	3.1	720,480	223,497	1,117,488
South Carolina.....	94,826	3.2	303,443	56,258	261,290
Georgia.....	279,857	4.00	1,119,428	271,534	1,086,136
Florida.....	101,000	3.43	343,700	70,064	280,256
Alabama.....	161,312	2.8	451,673	160,632	642,528
Mississippi.....	210,126	3.0	630,384	204,745	818,980
Louisiana.....	102,413	3.5	358,445	106,621	475,298
Texas.....	1,517,821	8	12,142,568	2,317,636	14,486,225
Arkansas.....	101,825	3.8	386,022	103,836	441,303
Tennessee.....	240,763	3.9	938,975	236,875	1,004,469
West Virginia.....	423,500	5.4	2,286,900	401,632	2,208,976
Kentucky.....	447,740	4.7	1,794,378	514,643	2,701,876
Ohio.....	2,655,333	5.7	15,249,398	2,764,499	15,836,369
Michigan.....	1,533,065	6.5	10,064,922	1,340,456	8,981,055
Indiana.....	653,446	6.4	4,182,054	647,369	4,260,094
Illinois.....	636,186	6.8	4,320,064	616,037	4,004,341

STATES.	1901.			1900.	
	Number of sheep.	Weight per fleece.	Clip (lbs.).	Number of sheep.	Clip (lbs.).
Wisconsin	711,520	6.75	4,802,760	726,040	4,719,260
Minnesota	400,163	6.8	2,721,108	409,187	2,761,809
Iowa	735,358	7.0	5,138,506	586,644	3,813,186
Missouri	680,000	6.22	4,229,600	670,128	3,420,768
Kansas	278,812	7.0	1,951,684	270,716	2,166,728
Nebraska	362,842	6.4	2,368,188	315,937	2,448,462
South Dakota	364,546	6.5	2,499,549	372,717	2,422,661
North Dakota	375,415	6.8	2,552,822	362,512	2,366,328
Montana	4,176,923	7.0	29,238,461	3,717,160	26,020,120
Wyoming	3,514,274	7.5	26,357,055	2,780,546	21,549,231
Colorado	2,498,200	6.5	16,238,300	2,128,508	13,303,176
New Mexico	3,060,000	4.5	13,725,000	3,786,688	16,093,424
Arizona	869,620	7.2	5,829,264	1,003,942	7,529,566
Utah	2,967,250	6	17,808,500	2,261,917	14,136,961
Nevada	875,315	7.3	6,389,799	612,387	4,592,908
Idaho	2,662,387	7.7	20,607,694	2,576,240	19,321,300
Washington	1,248,202	7.5	9,361,515	759,399	6,454,892
Oregon	3,096,066	7.7	23,839,708	2,361,274	18,810,192
California	1,927,882	8.5	16,386,997	1,907,430	13,362,010
Oklahoma	48,000	6.4	307,200	32,432	218,916
	42,790,083	6.61	283,047,033	40,267,818	269,972,815
Pulled Wool			38,142,500		26,663,306
Total Product			321,189,533		288,636,621

WOOL CLIP OF THE UNITED STATES.

Lbs.		Lbs.		Lbs.		Lbs.	
1840.....	35,802,114	1871.....	160,000,000	1882.....	272,000,000	1892.....	294,000,000
1850.....	52,516,959	1872.....	150,000,000	1883.....	290,000,000	1893.....	303,153,000
1860.....	60,264,913	1873.....	158,000,000	1884.....	300,000,000	1894.....	298,067,384
1863.....	106,000,000	1874.....	170,000,000	1885.....	308,000,000	1895.....	309,748,000
1864.....	123,000,000	1875.....	181,000,000	1886.....	302,000,000	1896.....	272,474,708
1865.....	142,000,000	1876.....	192,000,000	1887.....	285,000,000	1897.....	259,153,351
1866.....	155,000,000	1877.....	200,000,000	1888.....	269,000,000	1898.....	266,720,684
1867.....	160,000,000	1878.....	208,250,000	1889.....	265,000,000	1899.....	272,191,330
1868.....	168,000,000	1879.....	211,000,000	1890.....	276,000,000	1900.....	288,636,621
1869.....	180,000,000	1880.....	232,500,000	1891.....	285,000,000	1901.....	321,189,533
1870.....	162,000,000	1881.....	240,000,000				

SHEEP FLOCK OF THE UNITED STATES.

January 1st.	Number.	Value.	January 1st.	Number.	Value.
1872.....	31,679,300	\$38,771,197	1887.....	44,759,314	\$69,872,639
1873.....	33,002,400	97,922,360	1888.....	43,544,755	89,279,926
1874.....	33,928,200	88,690,569	1889.....	42,599,079	90,640,369
1875.....	35,783,600	94,320,000	1890.....	44,336,072	100,659,761
1876.....	36,935,800	93,666,318	1891.....	43,431,136	108,397,447
1877.....	35,804,200	80,892,683	1892.....	44,938,365	116,121,290
1878.....	35,740,500	80,603,062	1893.....	47,273,553	125,909,264
1879.....	38,123,000	79,023,964	1894.....	45,048,017	89,186,110
1880.....	40,765,900	90,230,537	1895.....	42,294,064	66,685,767
1881.....	43,569,899	104,070,759	1896.....	38,298,783	85,167,736
1882.....	45,016,224	106,596,954	1897.....	36,818,643	67,020,942
1883.....	49,237,791	124,366,336	1898.....	37,656,960	92,721,133
1884.....	50,626,626	119,902,706	1899.....	39,114,453	107,697,530
1885.....	50,380,243	107,960,650	1900.....	41,883,065	122,665,913
1886.....	48,322,331	92,443,867	1901.....	*42,790,033	

* Estimated April 1, 1901.

WRESTLING. The only recognized and regular wrestling contests in the United States are those conducted by the Amateur Athletic Union. In 1901 the winners at the various weights were: At 105 pounds, William Karl, Metropolitan Athletic Club; 115 pounds, George Owens, Verner Athletic Club; 125 pounds, C. Nillot, Pastime Athletic Club; 135, 145, and 158 pounds, Max Wiley, Rochester Athletic Club.

WYOMING, a northwestern State of the United States, has an area of 97,890 square miles. The capital is Cheyenne. Wyoming was admitted to the Union on July 10, 1890. The population in 1900 was 92,531, while in June, 1901, as estimated by the government actuary, it was 96,000. The two largest cities and their populations in 1900 were: Cheyenne, 14,087, and Laramie, 8,207.

Finance.—The receipts of the treasury department for the year ending September 30, 1901, were \$413,863.68, and the expenditures \$386,876.83. At the end of the

year the net balance in the general fund was \$31,570.71. As returned for taxation, the total valuation of property in the State in 1901 was \$39,581,216.55. The total amount of taxes raised in the year amounted to \$947,556.

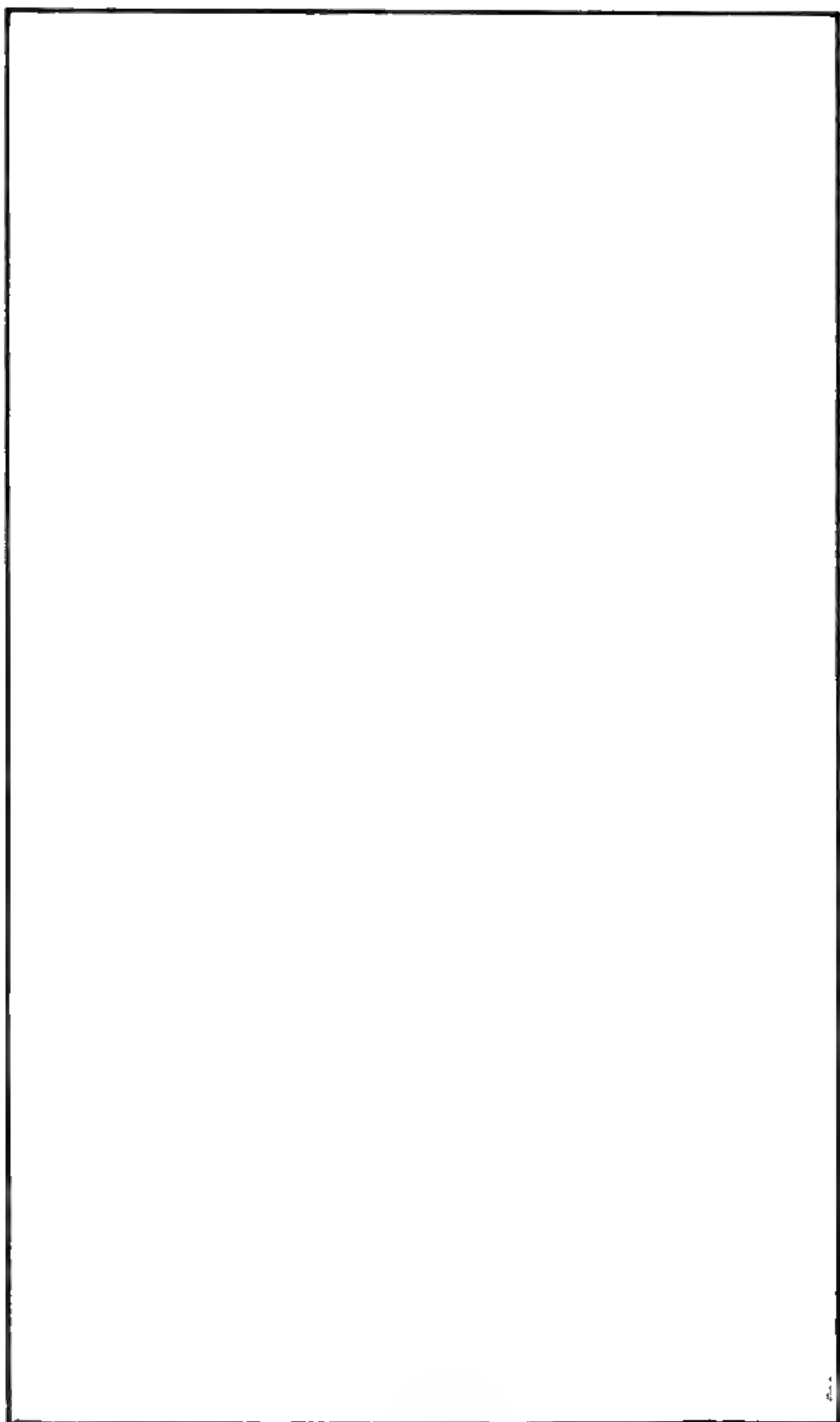
Industries.—The census reports of 1900 show an increase in the manufacturing interests of Wyoming since 1870. In that time the population advanced from 9,118 to 92,531 and the average number of industrial wage-earners from 502 to 2,241, embracing in 1900 2.5 per cent. of the total population. In 1900 the amount of actual capital invested in 334 establishments reporting, exclusive of capital stock, was \$2,411,435; the gross value of the output, inclusive of products re-used in the process of manufacture, was \$4,301,240. Wyoming is primarily a stock-raising and mining State, its manufactures being largely limited to products for local consumption; hence the increase shown by the returns is chiefly in "neighborhood industries," carried on in small shops. The following are the important industries, with the value of the 1900 output: Car construction and repair-shop work, \$1,109,813; lumber and timber products, \$831,558; carpentering, \$445,001; flouring and grist mill products, \$215,447. Iron ore and petroleum are abundant, but the lack of transportation facilities has handicapped the development of the deposits, and consequently the development of industries dependent upon their presence.

Legislation.—An important act passed by the legislature in 1901 for the purpose of allowing municipalities to gain control of public utilities within their boundaries directed that any city or town in Wyoming, incorporated or thereafter incorporated, should have power to construct or purchase plants of any nature for the furnishing of light, heat, or power. And to this end, such city or town was authorized to issue special bonds, to be paid for in not more than 20 years, to be sold at not less than par, and to aggregate in amount not more than 2 per cent. of the assessed valuation of property within the municipality. To pay the interest and to create a sinking fund for the payment of the bonds, special taxes were to be levied, and both the taxes and the bonds were to be in addition to any and all other taxes and bonds authorized by law; but the bonds were not to be issued except upon an affirmative vote of the electors of the municipalities. An example of the principle of democracy carried to its ultimate conclusion was shown in a law providing that at the general election of 1904 the permanent locations of the seat of State government, the State university, the insane asylum, and the State penitentiary shall all be determined upon by popular vote. Any city, town, or village was to be allowed to be a candidate for one or more or all of these honors, and the candidates receiving the greatest number of votes were to be declared winners. The present capital of the State is Cheyenne. A law to enhance the comfort of women employees directed that any person or corporation employing women in any manufacturing, mercantile, or mechanical establishment should provide suitable seats for their employees and should allow the women to use them when not necessarily engaged in their active duties. Foreign insurance companies were required to file with the State auditor an affidavit making him and his successors in office their lawful attorney, upon whom service might be taken and against whom legal proceedings might be instituted. The office of State geologist was created, and the governor was directed to appoint for a term of six years a State geologist who, as one of the qualifications for his office, should have no pecuniary interest in any mining property of the State. The State geologist was directed to examine mining specimens, prospectuses, and mines, charging proper fees therefor, and to collect and disseminate such information as to the mines and mineral wealth of the State as might advertise the same and develop the mining resources of the State. The governor was directed also to appoint a commission of five members to constitute a commission to investigate the subject of arbitration and the desirability of creating a permanent State board of arbitration. A law to check facilities for divorce, so far as non-residents of the State were concerned, provided that no divorce should be granted to non-resident persons until they had resided in Wyoming at least one year, instead of, as under existing law, six months. An educational law directed that there should be taught in public schools, "in addition to the other branches of study now prescribed, a system of humane treatment of animals, such instruction to consist of not less than two lessons of ten minutes per week."

State Officers.—Governor, holding office from January, 1899, to January, 1903, De Forest Richards, Republican; secretary of state, F. Chatterton; treasurer, George E. Abbott; auditor, Leroy Grant; attorney-general, J. A. Van Orsdel; superintendent of education, T. T. Tynan; chief justice, term eight years, ending January, 1903, Charles N. Potter.

Congressional Representatives (57th Congress).—In the House: Frank W. Mondell, Republican, from Newcastle. In the Senate: Clarence D. Clark (until 1905), from Evanston, and Francis E. Warren (until 1907), from Cheyenne—both Republicans.

X RAYS. See RÖNTGEN RAYS IN MEDICINE.



INTERNATIONAL YACHT RACE.—Upper—Shamrock in Dry Dock. Lower—Columbia
in Dry Dock.

YACHTING. The twelfth series of matches for the *America's Cup* took place off Sandy Hook, September 27-October 4, 1901, after two postponements, one caused by an accident to the British challenging yacht, in England, and the other by the death of President McKinley. In a series of close but decisive contests, *Shamrock II.*, Royal Ulster Yacht Club, Sir Thomas Lipton owner, was defeated by *Columbia*, the same yacht which had defeated the first *Shamrock* in 1899. *Columbia* was chosen cup defender after a series of 21 races with *Constitution*, a Herreshoff boat built as a new defender for Messrs. Belmont, Bourne, Payne, Stillman, and Walters. Few yachtsmen doubted that *Constitution* was potentially the faster boat, but it seemed impossible to tune her up to racing trim, owing to various militating factors; in particular, ill-fitting sails. Thus, for the first time in the history of the cup contests, an American yacht was twice defender of the *America's Cup*. The new *Shamrock* was apparently a faster boat than *Shamrock I.*, as the *Columbia* was undoubtedly faster than in 1899. The *Constitution* was not the only candidate for cup defender in 1901, Thomas W. Lawson, of Boston, having had built the fast *Independence*, designed by B. B. Crowninshield and built by George F. Lawley. This boat sailed a few times against the Herreshoff boats, but the owner refused to take such steps as would have made it possible to enter the *Independence*, by racing his yacht in the name of some member of the New York Yacht Club, and his boat was therefore not eligible. The contest was to be decided by the best three out of five races, *Shamrock* allowing *Columbia* 43 seconds of time by reason of her larger measurements. The course was 30 miles outside Sandy Hook, either 15 miles to leeward or windward and return, or a triangle of three equal sides of 10 miles each. The first race, September 28, was 15 miles to windward and return in a smooth sea and a true wind of from 8 to 10 knots. The *Shamrock* gained 30 seconds on the windward sail-out, but lost 1m. 16s. on the run home, losing the race by 1m. 20s. The second race, October 3, over a triangular course, was sailed on a flat sea two-thirds of the way and a 12 to 15-knot breeze on the last leg. *Columbia* gained 22 seconds on the first leg, 30 on the second, and 2 minutes on the third, winning the race by 3m. 35s. The third and final race, October 4, was 15 miles to leeward and return. The sea was flat, with a 10-knot breeze to begin, getting lighter and fitful toward the end. In going out *Shamrock* beat *Columbia* 49 seconds and *Columbia* gained 47 seconds on the beat home. *Shamrock* crossed the line first by 2 seconds, but her time allowance being added, 43 seconds, *Columbia* won by 41 seconds. It was the most exciting finish of any race ever sailed for the cup.

The seventh annual match for the Seawanhaka International Challenge Cup was easily won on Lake St. Louis by the *Senneville*, Royal St. Lawrence Yacht Club, in three straight races. In the race for the *Canada's Cup*, August 10, off Chicago, the English-built challenger, *Invader*, Royal Canadian Yacht Club, defeated the American boat *Cadillac*, in two races and a foul. Canada thus regained the trophy, which had been taken from her by the American boat *Genesee*, of the Chicago Yacht Club, in 1899. The usual important regattas of the New York, Atlantic, Larchmont, and other yacht clubs were held during 1901, and the usual interesting series of races between the 51-foot class, the 30-footers, the 21-foot raceabouts, and other small boats.

YALE UNIVERSITY. The event of first importance at Yale during 1901 was the celebration, October 20-23, of the two-hundredth anniversary of the founding of Yale College. Plans for the celebration had been in preparation for nearly three years. The celebration included the publication of a series of books by officers of the university; exhibitions of historical and educational material; addresses upon the past history of Yale; the dedication of the new University Hall, a gift from the alumni; the completion of a \$2,000,000 bi-centennial fund; and, in a certain sense, the inauguration of a new policy in the government of the university. Invited guests were present from all of the leading institutions in America and Canada, and representatives were also present from universities and learned societies in England, France, Germany, Austria, Italy, Denmark, Sweden, Belgium, Russia, and Japan. The President of the United States, members of the cabinet, senators, and deputations from the State and city government were among the invited guests. Thousands of alumni returned to take part in the ceremonies. The exercises, lasting four days, will be remembered long by those who were fortunate enough to be able to participate in them. In connection with the bi-centennial celebration a series of 25 volumes by members of Yale's faculties was published. These were scholarly volumes and indicated the kind of work, scientific, literary, and historical, that is being done in the various departments of the university. The bi-centennial memorial fund of over \$2,000,000, raised chiefly by the alumni, is being used in the erection of a series of memorial buildings. Those now being erected are the new administration building, the large and well-equipped dining hall, and the memorial chapel. The changes in the course of study at Yale are among the most prominent signs of a new spirit in the university. The old principle of a fixed curriculum has been

entirely abandoned in the last three years of the academic work, Yale placing herself in this respect along with Harvard, Cornell, Stanford, and a number of other institutions. The work of these years is now entirely elective, the student being required to do a definite quantity and quality of work, but the selection of the courses being left to the student himself. The one degree of bachelor of arts is given to all who graduate from Yale College, and the one degree of bachelor of philosophy to all who graduate from the Sheffield Scientific School. The report of the treasurer for the year ending July 31, 1901, shows an increase in the permanent funds of the university amounting to \$595,027.73, and \$345,470.16 for buildings, though the bulk of the latter formed a part of the \$2,000,000 bi-centennial building fund. The university catalogue for 1901-02 shows a total of 2,685 students in attendance, 338 of whom were in the graduate school, 675 in Sheffield Scientific School, 1,240 in Yale College, 249 in the law school, 147 in the medical school, and 100 in the divinity school.

YEATMAN, JAMES E., philanthropist, died at St. Louis, Mo., July 7, 1901. He was born in Bedford County, Tenn., in 1818, and engaged in business at St. Louis in 1842. Among his business enterprises was the founding of the Merchants' National Bank, about 1850, but his greatest work was the service he performed as president of the Western Sanitary Commission during the Civil War, by which he won the affection and esteem of both armies. Although a close friend and adviser of Lincoln, his beneficence reached the suffering of both North and South. Readers of one of the late popular novels of the Civil War period have recognized Mr. Yeatman as the "Calvin Brinsmade" of Mr. Winston Churchill's *The Crisis*.

YELLOW FEVER. The accounts received from Havana, Cuba, long regarded by the United States as the special menace as far as yellow fever is concerned, were very satisfactory in 1901. In 1899 there were 284 cases of the disease in Havana, with 103 deaths, or over 36 per cent. In 1900 the number of cases in Havana reached 1,244, with 310 deaths, or 24 per cent. In 1901 there were about 146 cases, with 44 deaths, or about 30 per cent. Considerable doubt is expressed by experimental bacteriologists as to the cause of yellow fever. The bacillus icteroides, discovered by Professor Giuseppe Sanarelli, is not finally accepted as the cause. Inoculation of exposed persons with anti-amaryilic serum prepared from cultures of the bacillus icteroides appears to have been abandoned. A series of experiments carried on in Cuba, with a view to determining the rôle of the mosquito in the transmission of yellow fever, included inoculating volunteers with the disease by means of infected mosquitoes. The facts sought were established, but three of the voluntary assistants died of the disease. The sanitary department of Havana offers to immunize any person by inoculating him with yellow fever, and caring for him during the course of the disease. This is a similar practice to inoculation with smallpox during good health, which prevailed before the introduction of vaccination. See **INSECTS AND THE PROPAGATION OF DISEASES; SERUM THERAPY; VITAL STATISTICS.**

YONGE, CHARLOTTE MARY, English novelist and writer on miscellaneous subjects, died at Otterbourne, Hampshire, March 24, 1901. She was born there August 11, 1823, and received a thorough education from her parents, who imbued her with a religious fervor that became the dominating motive of her later life. At 18 she wrote her first novel, which marked the beginning of an industrious literary career, during which she produced about 125 volumes. Some of her novels, which have been widely read, are: *Heartsease* (1854); *The Daisy Chain* (1856); *Hopes and Fears* (1860); *The Dove in the Eagle's Nest* (1866); *The Chaplet of Pearls* (1868); and *Forget-Me-Not* (1900). In other directions she compiled historical works, the best-known of which are: *The Kings of England* (1848); *Landmarks of History, Ancient, Middle Ages, and Modern* (3 vols., 1852-57); and *Cameos from English History* (1868); and she wrote also *The History of Christian Names* (1863); *Life of Bishop Patteson* (1873); a monograph on *Hannah More* (1888); and a *Life of the Prince Consort* (1889). She was editor for some time of the *Magazine for the Young*, and, for more than 30 years, of the *Monthly Packet*, in which many of her novels first appeared. In her novels she wrote primarily for her younger readers, and by interweaving strong religious principles in the form of her own High Church doctrines, sought the solution of ethical questions. But as more than merely didactic, her work has been intrinsically enjoyed by others than school-girls and those who concur in her theological beliefs, the power of her *Heir of Redclyffe* (1853), and *The Little Duke* (1854) being acknowledged by such men as William Morris and Rossetti. An ardent supporter of missionary effort, she used a portion of the profits from *The Heir of Redclyffe* to provide the schooner *Southern Cross* for Bishop Selwyn's work, and \$10,000 from the sale of *The Daisy Chain* to found a college at Auckland, New Zealand. An illustrated edition of her more popular novels was published in 35 volumes (1888-89).

YOUMANS, WILLIAM JAY, American editor, died at Mount Vernon, N. Y., April 10, 1901. He was born near Saratoga, N. Y., April 14, 1838, and received his

education at Columbia College, the Sheffield Scientific School, and the medical department of New York University, where he graduated in 1865. After studying under Huxley in London, he practiced medicine for three years in Minnesota. With his brother, Edward Livingston Youmans, he established the *Popular Science Monthly* in 1872, and was joint editor until 1887, when, upon his brother's death, he assumed full editorial charge. Besides this work, Dr. Youmans was connected with Appleton's *Annual Cyclopaedia* for a number of years, contributing the articles on chemistry, metallurgy, and physiology. He also published *Pioneers of Science in America* (1895); edited Huxley's *Lessons in Elementary Physiology*, adding a second part, on *Elementary Hygiene* (1867); and revised his brother's *Class-book of Chemistry* (1889).

YOUNG, Mrs. ZINA D., widow of the Mormon Church disciple, Brigham Young, died at Salt Lake City, Utah, August 29, 1901. She was born at Watertown, N. Y., in 1861, and became a convert to Mormonism at Kirtland, O., where she married one of Joseph Smith's converts. Later she became Smith's wife for "eternity," and, at the same time, the wife of Brigham Young for "time." Mrs. Young organized the first relief society of the church and was president of the organization at the time of her death.

YOUNG MEN'S CHRISTIAN ASSOCIATION. The thirty-fourth international convention and golden jubilee of the Young Men's Christian Association of North America was held at Boston in June, 1901, followed, during the same month, by the summer student conferences at Pacific Grove, Cal., Lake Geneva, Wis., Asheville, N. C., and Northfield, Mass. The commencement of the Chicago Secretarial Institute and Training School took place on May 31, and that of the Springfield International Training School on June 9. The *Jubilee Year Book*, published in 1901 by the international committee of the Y. M. C. A. of North America, contains statistics covering the entire period of work since the organization of the first association in London, in 1844. From that time on the work spread rapidly, until, in 1901, there were over 6,200 separate associations in nearly every important country in the world, with over 533,000 members, and 610 buildings owned and occupied and possessing a total value of over \$28,000,000. In the United States and Canada since 1866 the number of associations has increased from 70 to 1,476, the total membership from 15,948 to 268,477, the number of buildings from none to 391, with an aggregate value of nearly \$21,500,000. America leads all the other countries in its Y. M. C. A. work, followed by Germany and Great Britain. In 1901 its American libraries aggregated over 523,000 volumes and nearly \$3,000,000 were being spent annually in the furtherance of local work; and more than 500 gymnasiums were maintained, over half of them under the charge of a physical director. There were 775 associations that maintained free reading-rooms; and 330 held educational classes, with nearly 27,000 different students. Over 400 associations were doing special work for boys, and there were 43 Indian, 86 colored, 161 railroads, and 577 college and student Young Men's Christian Associations. About 715 associations were employing general secretaries, and about 1,600 men in all were permanently engaged in association work. Army stations in building or tent were maintained as follows: United States, 16; Cuba, 16; Porto Rico, 10; Philippines, 48; China, 14; Alaska, 3; Hawaii, 1, and on transports, 9. A naval branch is established at Brooklyn, New York City, which has an annual attendance of 40,000 sailors, with 10,000 beds occupied. Navy branches are instituted on many of the United States vessels of war, and stationery and literature are supplied to American sailors, and religious and social meetings provided, whenever possible, to vessels of the fleet at various points throughout the world. Of the 6,219 associations in the world, 1,476 are in North America, having a membership of 268,477, occupying 391 buildings of their own valued at \$21,445,415. The general board of the international committee has its headquarters at 3 West Twenty-ninth Street, New York City; chairman, Lucien C. Warner; general secretary, Richard C. Morse. The central international committee has its headquarters at No. 3, General Dufour, Geneva, Switzerland; chairman, Edward Barde; secretary, Louis Perrot. The executive committee of the State of New York has its general office at 156 Fifth Avenue, New York City; chairman, Edward P. Platt; secretary, George A. Hall.

YOUNG PEOPLE'S CHRISTIAN UNION (OF THE UNITED BRETHREN IN CHRIST), since its founding in 1890 at Dayton, O., has gained 80,000 adherents, comprised in about 2,150 societies, of which 450 are junior societies. The work of the order is similar to that of the Society of Christian Endeavor, many of the societies being affiliated with that organization. *The Watchword*, published by the society under the editorship of Rev. H. F. Shupe, has attained to a circulation of some 22,000. During 1901, the various branches held conventions marked by splendid interest; the General Biennial Convention will be held in July, 1902, at Canton, O. President, Rev. J. P. Landis, D.D., Ph.D.; corresponding secretary, Rev. C. W. Brewbaker, Ph.M., S.T.D., Canton, O.

YUAN-SHI-KAI, Chinese military leader, succeeded Li Hung Chang (*q.v.*) as viceroy of the province of Chili in 1901, and thus assumed one of the most important posts in China with reference to the foreign influence. He is about forty-five years old, and was educated in the Chinese schools, passing through the required examinations to the governorship of the turbulent province of Shantung. For several years he was an officer in the imperial army, and while at the head of the army of Shantung he organized the best military force in China. As a provincial governor he distinguished himself by his intelligence, energy, and patriotism; and, while he has shown a willingness to adopt the methods of the foreigners in administration, he has consistently upheld the right of China to govern herself and has opposed the extension of foreign influence over her affairs.

ZANARDELLI, GIUSEPPE, Italian statesman, was made prime minister of Italy in 1901. He was born in Brescia in 1826, and graduated in law at the Ghislieri College of Pavia in 1848. As a member of the students' legion he took part in the revolution immediately after graduation, and being appointed a revolutionary agent, directed preparations for the revolt in Brescia in 1849. In this uprising he was captured, but escaped, and, in consequence of a special amnesty granted by the Austrian government, returned to Brescia, where from 1851 to 1859 he lived as a private teacher of jurisprudence. In 1859, when Lombardy became free, he was sent to the Piedmontese parliament, where he sat for several terms. In 1866 he became a *commissario regio* for Belluno under the ministry of Ricasoli, and in 1876, after the ministerial crisis, he became minister of public works in the cabinet of Signor Depretis. Under the Cairoli ministry in 1878 he was appointed to the home office, but joined the opposition upon the fall of that ministry. He was minister of justice under the various Crispi ministries, and the present Italian penal code, adopted in 1890, was due chiefly to his work. In 1894, upon the fall of the Giolitti ministry, he endeavored to form a cabinet, but was displaced by Signor Crispi, against whom he then arrayed himself. This hostility resulted in the defeat of Signor Zanardelli in a provincial election in Brescia in 1895. After the general elections of 1897, he allied himself to Giolitti in support of the Marchese di Rudini in the Italian chamber. His policy is particularly noteworthy for its anti-clericalism. See ITALY.

ZANZIBAR, a British protectorate off the east coast of Africa, consisting of the island of Zanzibar, with an area of 640 square miles, and a population of 250,000; the island of Pemba, area 380 square miles, and population 50,000; and a number of smaller islands stretched along the shore of the German East African dominions. The capital is Zanzibar, with a population of about 30,000. The religion is Mohammedan, most of the inhabitants belonging to the Sunni sect. The kingdom of the sultans of Zanzibar, formerly including large areas on the mainland, has of late years been restricted to the island possessions. It was made a British protectorate in 1900, and a British agent and consul-general was appointed, under whose direction the native sultan administers the government. The present sultan is Hamoud bin Mahomed bin Saïd, and the British agent, Sir C. N. E. Eliot. The revenues of the sultan are largely derived from customs dues and produce taxes, the most important being that on cloves. Under a new arrangement a "private purse" of the value of 120,000 rupees annually has been established for the sultan, this being kept separate from the general revenue of the country. All the expenditures for public improvements, harbor works, and police must receive the approval of both the sultan and the British agent. There is a native coinage, but the British Indian rupee is the coin generally current. The rupee is worth 32.4 cents. The port of Zanzibar is the centre of East African trade, an important element of which is trans-shipping to and from the coasting vessels. The bulk of the trade is with British India and British and German East Africa, but there is a large direct trade with Germany, France, and England. The imports at the port of Zanzibar, exclusive of the transit trade, amounted in 1899 to £1,596,606, and the exports to £1,513,407, both figures showing a considerable increase over the trade of 1898. The principal exports are cloves, ivory, copra, gums, rubber, and hides. The value of cloves exported in 1899 was over £200,000.

According to a parliamentary paper made public in the early summer of 1901, the suppression of the slave trade in Zanzibar has been practically accomplished, and considerable progress has been made in the abolition of slavery itself. According to this document, it was estimated that of the 100,000 slaves in the protectorate in 1897, only 53,000 still remained in bondage, and of the latter number almost all preferred bondage to the responsibilities of freedom.

ZINC. The production of spelter (commercial zinc) in the United States in 1900 amounted to 123,886 short tons, valued at \$10,654,196, as against 129,051 short tons, valued at \$14,840,865 in 1899. The product came chiefly from Kansas, Illinois, and Missouri. The total value of the imports of sheet and manufactured zinc amounted to \$128,090 in 1900, while the imports of zinc oxides were 2,618,808 pounds in the dry form, and 38,706 pounds in oil. The total value of the exports of zinc

and zinc ore of domestic source from the United States in 1900 was \$3,450,644, while the exports of zinc white were 48,840 short tons. The ores exported go to Belgium, Netherlands, Germany, Great Britain, Canada, and Mexico, while the bulk of the spelter goes to Great Britain. The world's production in 1900 amounted to 470,937 long tons, of which the United States produced 23.5 per cent. The production of 1901 will probably show a slight increase, due mainly to increased activity in the mining districts of southwestern Missouri and southeastern Kansas. Some new discoveries of ore were made near Granby lying southeast of Joplin. The grade of ore which is now produced by concentration in that district is rather high, some of it containing 64.5 per cent. of zinc. The introduction of some new types of magnetic separators serve to extract the pyrite from the ore. There was much activity in the zinc-smelting industry in the vicinity of Iola, Kan., where the smelters are using natural gas as a fuel. One plant has been equipped with an acid department, and a zinc smelter is in course of erection, which will use the zinc blende concentrates from different points in Colorado. Two new works for the manufacture of sheet zinc have been started, one in Pennsylvania and the other in Kansas. H. F. Bain (*Trans., Amer. Inst. Min. Eng., Richmond meeting, 1901*), in a paper on the *Origin of the Joplin Ore Deposits*, states his opinion that they result from the general action of the underground waters. He bases these views on the presence of many joint and fault cracks in the rocks, and believes that the metals were deposited by ore bearing solutions rising from the deeper or dolomitic limestones, because the ores are everywhere associated with great quantities of dolomite, while the country rock has none, and furthermore the ore bodies of the Joplin region are usually closely related to the system of fractures and faults that have broken the underlying Eureka-Kinderhook shale.

The following table from reports of the United States Geological Survey gives the production of spelter, in tons, in the United States by States in 1899 and 1900:

	1899.	1900.
Kansas	52,021	62,136
Missouri	18,107	14,741
Illinois and Indiana.....	50,118	38,759
Eastern and Southern States.....	8,805	8,259
Total.....	129,051	123,886

ZIONIST CONGRESS. See JEWS.

ZOOLOGICAL EXPEDITIONS AND STATIONS. The number of expeditions, temporary stations, and permanent establishments for the study of zoology increased so greatly during 1901 that it is impossible satisfactorily to classify them other than by their geographical location. Africa, having been so much given over to wars and rumors of wars, was not the field of any important zoological expeditions aside from the work of Sir Harry Johnston in Uganda (see **MAMMALOGY**) and Major Ross's struggle with the mosquito on the west coast (see **ENTOMOLOGY**). In Australia the Queensland government appropriated \$7,500 for a marine biological laboratory in connection with the pearl fisheries near Thursday Island, and placed a zoologist in charge.

Asia.—This continent has been the field of a number of zoological expeditions, which have added or will add much to our knowledge of its zoology. In the extreme north a Russian expedition sent out by the St. Petersburg Academy of Sciences to examine and bring home a frozen mammoth, succeeded after many hardships in accomplishing its object, bringing back the skeleton and skin of a middle-aged male mammoth. Remains of undigested food were found in the stomach. The biological station at Goloustnaya on Lake Baikal has been closed, although rich and valuable collections, especially of fishes and amphipods, had already been made. In March, 1901, Messrs. Annandale and Robinson, of University College, Liverpool, set out for a year's sojourn on the coast of eastern Siam, in the province of Patani. They purposed not only to study the land and marine fauna, but especially to examine into the past and present inhabitants of certain large limestone caves in the district, and also to make observations on the natives of the region. Professor Bashford Dean, of Columbia University, spent the greater part of 1901 in Japan and the Philippines making extensive zoological collections and devoting much time to the study of the development of the Port Jackson shark and other fishes. He secured numerous specimens of the nautilus during a visit to southern Negros, P. I., and made many interesting observations in regard to its distribution and habits.

Europe.—There is little to record of any special interest in regard to the various biological stations of the continent or of Great Britain. The Liverpool committee, who have charge of the station at Port Erin, have recently made arrangements with the Manx government, in accordance with which they are to take charge of investi-

gations into the fisheries of the Irish Sea, and in return are to receive funds that will permit considerable additions to the equipment of the station. The West of Scotland Marine Biological Station has been even more fortunate, an anonymous donor having given it the sum of \$17,500 to purchase a steamer and to increase the endowment. The station is located at Millport on the island of Cumbræ in the Firth of Clyde, and was an important point of interest to visitors at the time of the Glasgow meeting of the British Association. Interest in Europe, and especially in Great Britain, in scientific exploration, has centred largely around the Antarctic expeditions of Great Britain, Germany, and Sweden, particularly the one setting out under the auspices of the Royal Society and the Royal Geographical Society of London. Although these expeditions are not by any means wholly zoological, one of their principal aims is the study of the fauna of the lands and seas which they explore, and it is expected that extensive zoological collections will be made. The Swedish expedition left in October, 1901, in the steam yacht *Antarctic*, going first to Buenos Ayres, thence to the Falklands, the South Shetlands, and King Oscar Land, where, if possible, winter quarters would be established. Two zoologists accompany the expedition, besides a botanist, a bacteriologist, a magnetician, and a geographer. The German expedition, in the steamer *Gauss*, also sailed in the fall, well equipped with scientists. It expects to explore the region east of that occupied by the Swedes; that is, the region south of Africa. While it is planned to make extensive zoological collections, no dredging will be attempted beyond the 1,000-fathom line. A third expedition is that planned by the Scottish National Antarctic Expedition, to explore the Weddell Sea, but this had not sailed at the end of 1901. The British vessel *Discovery* sailed early in the fall to take up work in Antarctic regions south of Australia and New Zealand. Although she carries two zoologists, one for vertebrates and one for invertebrates, she left England with a scientific director, who intended to go only as far as Australia. The well-known geologist Dr. J. W. Gregory was to have been in charge, but owing to most unreasonable and absurd rulings as to his relation to the commander of the vessel, he was obliged to resign. The results of this expedition are looked forward to with great eagerness, but the treatment of the representatives of the Royal Society by Sir Clements Markham of the Royal Geographical Society has alienated the interest and support of most zoologists. The latter's attitude is well shown in Professor E. B. Poulton's letter of May 15, 1901, to the Fellows of the Royal Society.

America.—The year was one of uniform prosperity, though not of notable progress, to the marine biological laboratories of the eastern United States. The summer schools at Wood's Hole, Mass., and Cold Spring Harbor, L. I., were supplemented by the Tufts College School at South Harpswell, Me., which enjoyed such a successful season that enlarged plans have been made for 1902. At all these schools, aside from the curriculum, much research work was undertaken and some very important zoological investigations were carried on. The laboratory of the United States Fish Commission at Wood's Hole was open as usual for investigators. The work was under the supervision of Dr. H. M. Smith; Dr. Bumpus, who had been director for several years, was prevented by other work from being at the station. The Commission's laboratory at Beaufort, N. C., was open from May until the end of September, in charge of Dr. H. V. Wilson. A great variety of investigations were carried on by about twenty workers, and some interesting discoveries were made. The laboratory at Put-in-Bay, O., was again opened in charge of Dr. H. S. Jennings, and a half dozen investigators were busy there, studying the biology of Lake Erie. An effort was made for the formation of a library at the station, specially dealing with questions of fresh-water biology. Of the various inland stations, which are no longer uncommon, mention can be made of only a few. That of Illinois deserves special notice because of the work that the State is doing on the fresh-water fishes. Their habits, distribution, variations, uses, etc., are being carefully studied, and a series of beautiful and accurate colored plates are being prepared to illustrate the various species of the State. New Mexico opened a biological station at Las Vegas, where there is reported to be a remarkably rich fauna. Montana maintained a very successful station on Flathead Lake, but a large proportion of the work done was botanical. On the Pacific Coast, besides the well-known Hopkins Seaside Laboratory at Pacific Grove, Cal., under the auspices of Leland Stanford, Jr., University, there was a very successful station at San Pedro, conducted by the zoological department of the University of California. A dozen or more investigators carried on work in that vicinity, with the idea of making a beginning at a detailed biological survey of the California coast. Among the field parties employed in the work of the United States Biological Survey, one is of special interest: Mr. E. A. Preble was sent during the summer to Athabasca and Great Slave lakes to study the birds and mammals of that region, with special reference to their geographical distribution. The most important American zoological expedition of 1901 undoubtedly was that under the auspices of the United States Fish Commission to

the Hawaiian Islands. The *Albatross* went to the islands early in June, remaining until September, and went back again in December. During the summer most of the work done was in shallow water, but it was planned to have the winter work include extensive dredging operations in deep water. Over 300 species of fish were taken, many new to science. Special attention was given to fishes and the fish industry, but the various groups of marine invertebrates were not neglected.

ZOOLOGICAL LITERATURE. The amount of literature, dealing wholly or in large part with the subject of zoology, which appeared during 1901 is enormous, and to recount properly its most important features would far exceed our space. We can hope only to mention some of the publications that have attracted the most attention or that best illustrate the trend of zoological work. First of all should be noted the new biological journal *Biometrika*, the first number of which appeared late in the fall. It is called "a journal for the statistical study of biological problems," and its editors are the well-known biological statisticians Galton, Weldon, Pearsons, and Davenport. Its appearance shows how rapidly statistical methods have come into favor and what a firm hold they have already secured. Although published in London, the journal aims to be cosmopolitan, and contributions will be published in French, German, and Italian as well as English. In all zoological literature, the use of scientific or technical names for animals is unavoidable, and it is therefore desirable that such names be as simple and comprehensible as possible. During 1901 there appeared a paper, in a supposably reputable journal, in which the other extreme is reached and all previous absurd and outlandish names are outdone. To the average layman *Balanoglossus kowalevskii* and *Strongylocentrotus dröbachiensis* seem utterly absurd, but they at least are correctly formed words with a definite meaning. What however shall we say of such creations as *Guilielmoherveria*, *Thomashuxleya* and *Asmithwoodwardia*? Surely zoological literature is in a fair way to rival the comic papers.

Popular Books.—Aside from the books on birds and insects, popular zoological works are scarce. Two have appeared in England which are, however, worthy of note. One is *Life by the Seashore: An Introduction to Natural History*, a volume of 350 pages, by Miss Marion Newbegin, dealing chiefly with the sea-coast animals of the eastern shore of Great Britain. The other book, by Gerald R. Leighton, is a volume of nearly 400 pages dealing with *The Life-History of British Serpents, and Their Local Distribution in the British Isles*. To American readers it will be a surprise to know there are only three species of serpents in the British Isles.

Text-Books.—At least three text-books of zoology appeared during 1901. Of these, two, *Animal Life: A First Book of Zoology*, by President Jordan and Professor Kellogg, of Leland Stanford, Jr., University, and *Elementary Zoology*, by Professor Kellogg alone, are American productions, while the third, *Zoology: An Elementary Text-Book*, by Shipley and MacBride, is an English work. The last is decidedly the most advanced of the three, although the treatment of the subject is simple and elementary, as the book is supposed to be for those who have had no previous knowledge of the subject. The book includes twenty-three chapters, each dealing with a "phylum" of invertebrates or a class of vertebrates. *Animal Life* is a volume of 329 pages, intended for beginners and based on the conviction that "the veriest beginner ought to be an independent observer and thinker." Kellogg's *Elementary Zoology* is a somewhat larger book, of the more conventional type, but still with many rather surprising innovations, such as the use of the toad in place of the frog in laboratory work. Both books are fully and admirably illustrated.

Special Treatises.—The latest volume in the Columbia Biological Series is *Regeneration*, by Thomas Hunt Morgan, of Bryn Mawr, based upon the series of lectures given by the author at Columbia University. The numerous observations on the power of regeneration in plants and animals are here brought together and discussed, together with the theoretical questions which they raise. Of the same series is Dr. Gary N. Calkins' volume on *The Protozoa*. This is a profusely illustrated and admirably written book, which aims to supply the average student or intelligent reader with an account of all the unicellular animals. It is the only book in English which does this, but in 1901 there was published in German the second section of a second edition of Arnold Lang's famous *Comparative Anatomy of Invertebrates*, in which the Protozoa are treated with comparative fullness and accuracy. The book contains over 300 pages and is profusely illustrated. An important work on sponges, from the pen of Professor Isao Iijima, is entitled *Studies on the Hexactinellida*, and is published at Tokio. It is the first part of a proposed monograph on that group of sponges which is unusually richly represented in the Japanese marine fauna. There are fourteen plates, which are admirably executed. The Liverpool Marine Biological Committee has issued another of their excellent little *Memoirs on Typical British Marine Plants and Animals*; the latest addition is *Alcyonium*, by S. J. Hickson. The volume compares favorably with the others of the series. A number of *Papers from the Harriman Alaska Expedition* appeared during 1901, perhaps the most notable of

which is the one by Dr. W. R. Coe, of Yale, dealing with *The Nemerteans*. Of the thirty-two species collected, twenty-seven are new. The colored plates are unusually well executed and are very attractive. Another volume (Part IV.) of Professor Lankester's *Treatise on Zoology* has appeared, this one dealing with the *Platyhelminia, Mesozoa, and Nemertini*. It is prepared by Professor W. B. Benham, and is well worthy to rank with the other volumes of the series. The *Cambridge Natural History* has also issued another volume, this one, on *Amphibia and Reptiles*. The quality of the work is sufficiently attested when it is said that the writer is the well-known authority, Dr. Hans Gadow. One more special treatise may be mentioned, an illustration perhaps of the extreme of specialization. It is a paper of over 200 pages, illustrated with twelve plates and twenty-two text-figures, dealing with *The Brain of Acipenser*. The author is Professor J. B. Johnston, and he has done an admirable though very technical piece of work.

General Treatises.—Under this head may be included works of travel or biography, or general science, which are largely zoological. One of the most important of such publications during 1901 is the magnificent work on *Alaska*, published as an authorized and full account of the famous Harriman expedition to that country in 1899. These two splendid volumes are beautifully illustrated and contain a wealth of information, much of which is zoological. The well-known Sarasin brothers have published a small volume, *Ueber die geologische geschichte der Insel Celebes auf Grund der Thierverbreitung*, which deals in a most interesting manner with the problems presented by the fauna of Celebes. The Cambridge University Press is publishing *The Fauna and Geography of the Maldives and Laccadive Archipelagoes*, a series of reports based upon the collections made in those islands in 1899 and 1900. Part I. has appeared with an account of the Hymenoptera, the Land Crustaceans, and the Nemerteans. An eighth edition of Carpenter's *The Microscope* has appeared as a volume of over 1,100 pages and more than 800 illustrations. Although not strictly zoological, it is largely devoted to that line of research. The Zoological-Botanical Society of Vienna has published a notable volume entitled *Botanik und Zoologic in Oesterreich in den Jahren 1850-1900*. A large share of the volume deals with zoology and the work of such notable zoologists as Claus, Schulze and Von Marenzeller. Certainly, if there ever were a successful "general treatise" of zoology, Gilbert White's *The Natural History and Antiquities of Selborne* was such, for over 100 different editions have been issued, and at least three during 1901; there was also published during the past year, *The Life and Letters of Gilbert White of Selborne*, a two-volume work by Rashleigh Holt-White, the naturalist's great grand-nephew. The book is charmingly written and will appeal to a large class of readers.

For other zoological literature, see ENTOMOLOGY, MAMMALOGY, and ORNITHOLOGY.

ZOOLOGICAL SOCIETIES. The year 1901 was notable for the large number of gatherings made up wholly or in part of zoologists. Among the newcomers on the field is the newly organized South African Association for the Advancement of Science, which was decided upon at Cape Town late in the summer. No Zoological section has yet been formed, but as the organization is based on that of the British Association doubtless zoologists will soon be well represented. Of European gatherings, aside from the International Congress of Zoologists (see below), we may mention the second annual meeting of the *Zoological Union of Italy*, which was held at Naples in April. The organization, though so young, already includes nearly all Italian professors of zoology and anatomy, and many students, and the attendance and the papers read show a healthy growth. The *French Association for the Advancement of Science* met at Ajaccio, Corsica, but the zoologists seem to have played an insignificant part. The *German Association of Naturalists and Physicians* met at Hamburg, September 22, under the presidency of the well-known zoologist, Professor Richard Hertwig. One of the principal addresses was by Professor Boveri on the *Problem of Fertilization*, the conclusion of which was that fertilization is not the cause of the development of the ovum, but is the means by which the characters of distinct individuals are combined in one body. Other important addresses were made by De Vries on his new mutations theory (see BIOLOGY); Zeigler, on the present position of the theory of descent, in zoology; Reinke, on the natural forces at work in organisms; Hertwig, on the cell theory; and Correns, on recent discoveries in hybridization. In addition to addresses there were numerous interesting exhibits one of which was quite novel: artificial spirit-aquariums showing the mode of life of mollusks, worms, and other aquatic animals. The meeting was divided into 27 sections, of which 16 were medical, and 1 was zoological. From a biologist's point of view, the meeting was an unusually important and interesting one. It was also notable for the social festivities which occurred. About 3,000 members registered for the meeting, one-third of them women. Of British societies, aside from the British Association (see below), the *Zoological Society of London* reported a successful year, with a slight increase in the number of visitors to the gardens, where there are now exhibited nearly 3,000 animals, more than half of

which are birds. The *Royal Society* held its annual conversazione on May 8, and many of the exhibits were zoological. Of these we can mention only a few of the most interesting: living specimens of the poisonous lizard, *Heloderma*, from Arizona; mormyrid fishes from the Nile; the Adelia penguin, with eggs and young; and animals from the great African lakes, especially Tanganyika. In the United States the *National Academy of Science* held its two semi-annual meetings at which several zoological papers were read. Professor Alexander Agassiz, the well-known zoologist, was chosen president. The *New York Zoological Society* had a very prosperous year. The new monkey-house has been opened, and a fine lion-house is planned. The most interesting arrivals of the year are five very large giant tortoises from the Galapagos Islands, the largest weighing 310 pounds. They represent three different species. The *American Microscopical Society* held its twenty-fourth annual meeting in Denver, Col., August 29-31. Although the attendance was small, the programme contained many papers of unusual interest. The Spencer-Tolles fund of \$1,200 was completed, and it was voted to use the income for microscopical research. Among the zoological papers presented, the most important were *The Solution of the Eel Problem, An Apparently New Hydra from Montana*, and *Notes on the Protozoa and Entomostraca of Colorado*. The first report of the *Limnological Commission* of the Society was published in June, stating what ends the Commission has in view, and its plans for the future.

The Fifth International Zoological Congress.—This, the most important gathering of 1901 in which zoologists are interested, was held at Berlin, August 12-16, under the presidency of Professor K. Möbius. More than 600 delegates were present, from Canada, the United States, Mexico, Brazil, and nearly all the countries of Europe. As about 150 papers were to be presented, the congress grouped itself in seven sections, an arrangement which, although necessary, had some serious disadvantages. The chief interest of the meetings centred around the renewed struggle between the new *vitalism*, championed by Driesch, and *mechanism*, championed by Roux and Ziegler. Bütschli gave one of the principal addresses, in which he too favored the mechanical hypothesis. The final result was of course a verdict of "not proven." Other notable addresses were Poulton's on *Mimicry and Natural Selection*, Grassi's on *The Malaria Problem*, Delage's on *The Theories of Fertilization*, and Forel's on *The Psychic Peculiarities of Ants*. The papers presented to the various sections were unusually important and interesting, but it is impossible to mention here even the titles of the best. Among the exhibits, perhaps the most notable was the magnificent collection of Hexactinellid sponges from the Japanese seas, collected by Professor Iijima. The next congress will be held in Berne in 1904.

The British Association for the Advancement of Science.—The British Association began its annual meeting at Glasgow, September 11, 1901, with a large attendance, including a number of scientists from abroad. The Zoological Section enjoyed the privilege of being presided over and addressed by Professor J. C. Ewart, who took for his subject *The Experimental Study of Variation*. It was a most valuable dissertation on the causes of variation as found in external conditions, and was based largely on the speaker's own experiments at Penycuik. Of the twenty-seven papers presented to the section, the following were of special interest: *Notes on Gulls Bred in Captivity*, by J. A. Thompson; *Zebras and Zebra Hybrids*, by J. C. Ewarts; *The Youngest Known Larva of Polypterus*, by J. S. Budgitt; and *The Origin of the Limbs of Vertebrates*, by J. G. Kerr. One of the most interesting features of the meeting was the exhibit by Professor Ewart of three of the famous Penycuik zebra hybrids.

The American Association for the Advancement of Science.—After a most prosperous year, the American Association met in Denver during August 26-31. While there is no comparison between the attendance at this meeting and that at similar meetings in Great Britain, France, and Germany, still the sessions were attended by several hundred scientific men from all parts of America. The address before the zoological section was delivered by its chairman, Professor C. B. Davenport, who took for his subject, *The Zoology of the Twentieth Century*. Aside from this paper, those presented before the section were not of wide interest, though several were of considerable importance to specialists. The association will meet in Pittsburgh in 1902 and again at the close of December in Washington.

The American Society of Naturalists.—*American Morphological Society.*—The meeting of the naturalists was held during the convocation week at Chicago, and was one of the largest and best meetings yet held. Uniting thus with the naturalists of the Central States gave an exceptional interest to the programme and discussions. Over 300 scientific men registered. Nearly 250 papers were read before the naturalists and affiliated societies, of which more than 50 were presented to the morphologists. One of the most notable was the address of the president, Professor W. T. Sedgwick, on *The Modern Subjection of Science and Education to Propaganda*, which was mainly taken up with a discussion of the questions of anti-vivisection,

temperance, physiology, and Christian Science. The large number of technical papers presented prolonged the meetings considerably, and crowded all of the sessions. Although there were many which were of very great interest, there were none of pre-eminent importance. At a general session of the naturalists there was an interesting discussion as to the relation of the naturalists to other scientific bodies, especially to the American Association for the Advancement of Science. The feeling seemed general that in some way the naturalists should become affiliated with that organization. In the end, the American Society of Naturalists and the Naturalists of the Central States perfected separate organizations, but appointed committees to confer as to some plan of union. Both societies voted to meet at Washington during convocation week, 1902, with the American Association. See ORNITHOLOGY.

INDEX OF TITLES

IN THE VOLUMES OF

The International Year Book

For 1898, 1899, 1900, and 1901.

[Page numbers are given in heavy-faced type.]

- Abbey, Edwin Austin, '01, 1.
Abbott, Evelyn, '01, 1.
Abbott, Lyman, D.D., '98, 1.
Abdurrahman, '01, 1.
Aberdeen, Earl of, '98, 1.
Abrasive, '98, 1; '99, 1; '00, 1; '01, 2.
Abruzzi, '00, 1.
Abydos, '98, 1.
Abyssinia, '98, 1; '99, 1; '00, 1; '01, 2.
Académie de Médecine, '98, 4; '99, 3; '00, 2.
Académie des Beaux-Arts, '98, 4; '99, 3; '00, 2.
Académie des Inscriptions et Belles-Lettres, '98, 4; '99, 3; '00, 2.
Académie des Sciences, '98, 4; '99, 3; '00, 2.
Académie des Sciences, Morales et Politiques, '98, 4; '99, 3; '00, 3.
Académie Française, '98, 4; '99, 3; '00, 3; '01, 3.
Academy of Arts, '98, 4.
Academy of Lisbon, '98, 4.
Academy of Medicine, American, '98, 5; '99, 3; '00, '01, 3.
Academy of Natural Science, '98, 4.
Academy of Political and Social Science, American, '98, 4; '99, 3; '00, 3; '01, 3.
Academy of Railway Surgeons, American, '98, 4.
Academy of Sciences, Berlin, '98, 5.
Academy of Sciences, Lisbon, '99, 3; '00, 3.
Academy of Sciences, Munich, '98, 5; '99, 3; '00, 3.
Academy of Sciences, National, '98, 4.
Academy of Sciences, Vienna, '98, 5.
Accumulators, '98, 5.
Acetopyrin, '00, 3; '01, 3.
Acetylene, '99, 3; '00, 3.
Acetylene Purification, '98, 7.
Achenbach, Heinrich von, '99, 3.
Acland, Sir Thomas Dyke, '98, 7.
Acoin, '99, 4.
Actinium, '00, 3.
Actinotherapy, '01, 3.
Actors' Fund of America, '98, 7; '99, 4; '00, 3.
Actors' Society of America, '98, 7.
Actuarial Society of America, '98, 8; '99, 4; '00, 3.
Adams, Herbert Baxter, '01, 3.
Adams, Julius Walker, '99, 4.
Aden, '98, 8; '99, 4; '00, 3; '01, 3.
Adis Abeba, '98, 8.
Adler, Dankmar, '00, 4.
Adonidin, '00, 4.
Adrenalin, '01, 4.
Adulteration, '99, 5; '00, 4; '01, 4.
Advancement of Science, American Association for the, '99, 5; '00, 4; '01, 4.
Advancement of Science, British, French and South African Associations for the, '01, 4.
Adventists, '98, 8; '99, 5; '00, 4.
Adventists, Seventh Day, '98, 8; '99, 5; '00, 4; '01, 5.
Adey, Sir John Miller, '00, 4.
Aerial Navigation, '98, 8; '99, 5; '00, 5; '01, 5.
Afghanistan, '98, 8; '99, 6; '00, 6; '01, 7.
Africa, '98, 8; '99, 8; '00, 8; '01, 7.
Africa, Botany of, '98, 13.
African Methodist Episcopal Church, '98, 13; '01, 9.
African Methodist Episcopal Zion Church, '98, 13; '01, 9.
African Transcontinental Telegraph Line, '00, 16; '01, 9.
Africaner Bond, '98, 13.
After Images, '99, 14.
Agardh, Jacob Georg, '01, 9.
Agassiz, Alexander, '01, 10.
Agassiz Association, '98, 13; '99, 15; '00, 16.
Agnew, John Thompson, '99, 15.
Agrarian Movement, '98, 14.
Agricultural Colleges, '00, 16.
Agriculture, '98, 16; '99, 15; '00, 16; '01, 10.
Agriculture, United States Department of, '98, 16.
Aguinaldo, Emilio, '98, 16; '99, 18; '01, 16.
Aherne, James, '01, 16.
Ainos, '98, 16.
Air, '98, 16.
Air Cushions, '99, 19.
Air-Lift Pumps, '98, 16.
Air-Ship, '00, 20; '01, 16.
Alabama, '98, 16; '99, 19; '00, 20; '01, 16.
Alaska, '98, 18; '99, 21; '00, 23; '01, 20.
Alaskan Boundary Question, '99, 22.
Alba, Duke of, '01, 22.
Albania, '01, 23.
Albatross Expedition, '99, 27; '00, 27.
Alcohol, '98, 21; '99, 27; '00, 27; '01, 23.
Aldrich, Louis, '01, 23.
Alexander, Sir Claude, '99, 28.
Alexander the Great, '98, 22.
Alexander, King of Serbia, '00, 28.
Alexandra, Queen of Great Britain, '01, 23.
Alexandria, '98, 22.
Alexis, Paul, '01, 23.
Alfonso XIII., King of Spain, '98, 22.
Alfred the Great Millennial, '01, 23.
Alfred, Prince, '99, 28.
Alfred, Prince Alfred Ernest Albert, '00, 28.
Algæ, '98, 22.
Alger, Horatio, '99, 28.
Alger, Russell Alexander, '98, 22.
Algeria, '98, 23; '99, 28; '00, 28; '01, 24.
Allen Insane, '01, 25.
Allan, Andrew, '01, 25.
Allan, George William, '01, 25.
Allen, Charles Grant Blairfindie, '99, 29.
Allen, Charles Herbert, '98, 23; '00, 29.
Allen, James Lane, '98, 23.
Alliance of the Reformed Churches, '98, 23.
Allman, George James, '98, 23.
Alma-Tadema, Lawrence, '98, 24; '99, 29.
Alsace-Lorraine, '98, 24; '99, 29.
Althaus, Dr. Julius, '00, 29.

- Aluminum, '98, 24; '99, 30; '00, 29; '01, 26.
 Alvarez, Albert Raymond, '00, 30.
 Alvary, Max, '98, 24.
 Ambulance, '00, 30.
 Ambidexterity, '01, 26.
 Ament, William Scott, '01, 26.
 America, Flora of, '98, 26.
 American Academy of Political and Social Science, '00, 30; '01, 26.
 American Association for the Advancement of Science, '99, 30; '00, 30.
 American Board of Commissioners for Foreign Missions, '01, 26.
 American Economic Association, '99, 30; '00, 30; '01, 27.
 American Federation of Labor, '00, 30; '01, 27.
 American Fisheries Society, '00, 30.
 American Institute of Electrical Engineers, '00, 30.
 American Library Association, '00, 30; '01, 27.
 American Medico-Psychological Association, '99, 30.
 American Microscopical Society, '99, 30; '00, 30.
 American Missionary Association, '01, 27.
 American Morphological Society, '99, 30; '00, 30.
 American Museum, '99, 30; '00, 30.
 American Ornithologists' Union, '99, 30; '00, 30.
 American Psychological Association, '99, 30; '00, 30.
 American Society of Bird Restorers, '99, 30.
 American Society of Naturalists, '99, 30; '00, 30.
 Amherst College, '98, 26; '99, 30; '00, 31; '01, 27.
 Amicla, Edmondo de, '98, 26.
 Ammen, Daniel, '98, 26.
 Ammonia (from Garbage), '98, 26.
 Ampere, New Determination of, '98, 25.
 Anæsthesia, '98, 25; '99, 30; '00, 31; '01, 27.
 Anam, or Annam, '98, 26; '99, 31; '00, 31; '01, 27.
 Anarchists, '98, 26.
 anarchy, '01, 28.
 Anatomists, Association of, American, '99, 31; '00, 31.
 Ancient Accepted Scottish Rite Masonry, '98, 27; '99, 31; '00, 31.
 Anderson, John, '00, 31.
 André, General, '00, 32.
 Andree, S. A., '98, 27.
 Andrew and Philip, Brotherhood of, '99, 31; '00, 32; '01, 30.
 Andrews, George Leonard, '99, 31.
 Angiosperms, '98, 27.
 Anglican Church, '98, 27; '99, 31; '00, 32; '01, 30.
 Anglin, Miss Margaret, '00, 32.
 Anglo-American Alliance, '98, 27.
 Anglo-American Commission, '98, 27; '99, 32.
 Anglo-American League, '99, 32.
 Angola, or Portuguese West Africa, '98, 27; '99, 32; '00, 32; '01, 30.
 Annenkoff, Michel, '99, 32.
 Annunzio, Gabriele d', '98, 28; '00, 289.
 Antarctic Exploration, '98, 28; '99, 32; '00, 33; '01, 31.
 Anthrax, '98, 28; '99, 34; '01, 34.
 Anthropology in America, '98, 28; '99, 34; '00, 34; '01, 401.
 Anticeltina, '01, 34.
 Antigua, '98, 32; '99, 39; '00, 39; '01, 34.
 Anti-Imperialist League, New England, '99, 39; '00, 40.
 Antimony, '98, 32; '99, 40; '00, 40; '01, 34.
 Antiquarian Society, American, '98, 32.
 Antiseptics, '98, 32; '99, 40.
 Antitoxin, '99, 40; '01, 34.
 Anti-Typhoid Inoculation, '00, 40.
 Antivaccinationists, '99, 40; '01, 34.
 Antivenene, '99, 40; '00, 40.
 Antwerp, International Congress at, '98, 32.
 Antwerp, Nations of, '98, 32.
 Appalachian Mountain Club, '98, 32; '99, 40; '00, 40.
 Appleton, William Henry, '99, 40.
 Aqueducts, '98, 32.
 Arabi Pasha, '01, 35.
 Arab Races, '00, 41.
 Arabia, '98, 32; '99, 40; '00, 41; '01, 34.
 Arbitration, International, '98, 33; '99, 41; '00, 41; '01, 35.
 Arbitration, Labor, '98, 34; '99, 41; '00, 42; '01, 37.
 Arbuthnot, Sir Charles George, '99, 42.
 Arbuthnot, Foster Fitzgerald, '01, 40.
 Arch, '98, 34.
 Archaeological Institute of America, '98, 34; '99, 42; '00, 46.
 Archaeology, '98, 35; '99, 43; '00, 45; '01, 40.
 Archaeology, American, '98, 42; '99, 50; '00, 53; '01, 48.
 Archbishops, '98, 48.
 Archer, Frederick, '01, 52.
 Architects, American Institute of, '99, 54; '00, 57.
 Architecture, '99, 54; '00, 57; '01, 52.
 Arc Lights, '00, 61.
 Arctic Exploration, '98, 46; '99, 56; '00, 61; '01, 55.
 Arecolin, '99, 59.
 Argentina, '98, 48; '99, 50; '00, 63; '01, 59.
 Argyll, Duke of, George Douglas Campbell, '00, 67.
 Arid Lands, '98, 51; '99, 63.
 Arizona, '98, 51; '99, 63; '00, 68; '01, 61.
 Arizona Antiquarian Association, '99, 65.
 Arkansas, '98, 53; '99, 65; '00, 69; '01, 63.
 Armenia, '98, 54; '99, 66; '00, 71; '01, 65.
 Armenians, '98, 54.
 Armies, '98, 54; '99, 67; '00, 71; '01, 65.
 Armor Plate, '00, 71.
 Armour, Herman O., '01, 65.
 Armour, Philip Danforth, '01, 65.
 Armstrong, Alexander, '99, 67.
 Armstrong, William George, '00, 71.
 Army, '99, 67.
 Army and Navy Union, '98, 54.
 Army of Santiago de Cuba, Society of the, '99, 67; '00, 72.
 Arnold, Thomas, '00, 72.
 Arran, Fifth Earl of, '01, 66.
 Arroyo, Oscar, '01, 66.
 Art, '98, 54.
 Artesian Waters, '98, 54.
 Artists' Society of America, '99, 67; '00, 72.
 Arts Club, National, '99, 67; '00, 72.
 Art Students' League, '98, 55; '99, 67; '00, 72; '01, 66.
 Asbestos, '98, 55; '99, 67; '00, 73; '01, 66.
 Ascension, '99, 67; '00, 73; '01, 66.
 Ascroft, Robert, '99, 67.
 Ashanti, '99, 67; '00, 73; '01, 66.
 Ashley, William James, '01, 66.
 Ashurst, John, Jr., '00, 73.
 Asia, '99, 67; '00, 73; '01, 66.
 Asia, Flora of, '98, 55.
 Asia Minor, '00, 74.
 Asiatic Association, '98, 55; '99, 70; '00, 74.
 Asiatic Society of Bengal, '98, 55; '99, 70.
 Asphaltum, '98, 55; '99, 70; '00, 74; '01, 66.
 Aspiroz, Manuel, '99, 71.
 Asquith, Herbert Henry, '01, 67.
 Assembly, General, '98, 55; '99, 71; '00, 74; '01, 67.
 Associate Reformed Synod of the South, '99, 71; '00, 74; '01, 67.
 Associated Press, '00, 74; '01, 67.
 Association for the Advancement of Science, American, '98, 55; '99, 5; '00, 4.
 Association for the Study and Cure of Inebriates, American, '98, 55.
 Association of American Agricultural Colleges and Experiment Stations, '00, 75.
 Association of American Anatomists, '98, 56.
 Association of American Medical Colleges, '98, 56.
 Association of American Physicians, '98, 56.
 Association of American Universities, '00, 75.
 Association of Assistant Physicians of Hospitals for the Insane, '98, 56.
 Association of Genito-Urinary Surgeons, American, '98, 56.
 Association of Ideas, '01, 67.
 Association of Life Insurance Medical Directors of America, '98, 56.
 Association of Medical Officers of American Institutions for Idiotic and Feeble-Minded Persons, '98, 56.
 Association of Military Surgeons of the United States, '98, 56.
 Association of Obstetricians and Gynecologists, American, '98, 56.
 Association of Physicians and Surgeons, American, '98, 56.
 Associations Bill, '01, 67.
 Asteroids, '98, 56; '99, 71; '00, 75.
 Asterol, '99, 71.
 Astor Library, '98, 56.

- Astronomical and Astrophysical Society, '99, 71.
 Astronomical Progress, '98, 56; '99, 71; '00, 75; '01, 67.
 Astronomical Society, American, '98, 68.
 Astronomy, Progress of, During the Century, '00, 965.
 Astro-Photographic Catalogue, '98, 68.
 Astro-Photography, '98, 68; '99, 83; '00, 85.
 Astro-Physics, '98, 68; '99, 83; '00, 85.
 Asylums for Insane, '01, 78.
 Atherton, Gertrude Franklin, '58, 68.
 Athletics, '99, 83; '00, 85; '01, 78.
 Atkinson, Edmund, '00, 87.
 Atkinson, Canon J. C., '00, 87.
 Atkinson, William Yates, '99, 84.
 Atmosphere, '98, 68.
 Atmosphere of Venus, '99, 84.
 Atmospheric Electricity, '99, 84.
 Atomic Weights, '00, 87; '01, 79.
 Atwater, Wilbur Olin, '00, 87.
 Atwood, Melville, '98, 68.
 Audran, Edmond, '01, 79.
 Audubon Society, '98, 68; '99, 84; '00, 88.
 Augur, Christopher Colon, '98, 68.
 Austin Dam, '00, 88.
 Australasian Association for the Advancement of Science, '98, 68; '00, 88.
 Australia, '00, 88; '01, 80.
 Australian Federation, '98, 68; '99, 84; '00, 88.
 Austria-Hungary, '98, 69; '99, 88; '00, 91; '01, 83.
 Austrian Archaeological Institute, '98, 74.
 Authors' Club, '98, 74.
 Automatic Writing, '98, 74.
 Automobile, '98, 74; '99, 93; '00, 99; '01, 90.
 Automobile Club of America, '00, 99.
 Automobile Fire Engines, '00, 99.
 Auto-Truck, '98, 80.
 Ava, Archibald Leofric Temple Blackwood, '00, 101.
 Aveling, Dr. Edward Bibbins, '98, 80.
 Averell, William Woods, '00, 101.
 Averoff, George E., '99, 94.
 Avvasovsky, Ivan Constantinoitch, '00, 101.
 Azores, '98, 80; '99, 94; '00, 101; '01, 92.
 Aztec Club, '98, 80.
 Babcock, Maltbie Davenport, '01, 92.
 Babylonia, '98, 80; '00, 101; '01, 92.
 Bacchylides, '98, 80.
 Bacheller, Irving, '00, 101.
 Bacilli, '99, 94.
 Bacillus Botulismus, '98, 81.
 Bacillus Prodigiosus, '98, 81.
 Bacteria, '99, 94; '00, 102; '01, 92.
 Bacteriology, '98, 81; '99, 94.
 Baden, Grand Duchy of, '98, 81; '99, 94.
 Baden-Powell, Sir George Smyth, '98, 81.
 Baden-Powell, Robert Stephenson Smyth, '99, 95; '00, 102.
 Bagdad Railway, '01, 92.
 Bahamas, '99, 95; '00, 102; '01, 92.
 Bahr-el-Ghazal, '98, 82; '99, 95; '00, 102.
 Bain, Thomas, '99, 96.
 Baker, Lewis, '99, 96.
 Baldwin, Evelyn Briggs, '01, 92.
 Baldwin, James Mark, '01, 92.
 Balize, '98, 82; '99, 96; '00, 103; '01, 93.
 Balkan Peninsula, '98, 82; '00, 103; '01, 93.
 Ball, Right Hon. John Thomas, '98, 82.
 Balloons, '00, 103; '01, 93.
 Ballou, Latimer Whipple, '00, 103.
 Baltimore, '98, 82.
 Baluchistan, '98, 83; '99, 96; '00, 103; '01, 93.
 Balzac, Rodin's bust of, '98, 83.
 Bamberger, Ludwig, '99, 96.
 Bancroft, Cecil Franklin Patch, '01, 94.
 Banffy, Desiderius, '98, 83; '99, 96.
 Bangkok, '98, 83.
 Bank—Banking, '98, 83; '99, 97; '00, 104; '01, 94.
 Bankruptcy, '99, 102; '00, 104; '01, 94.
 Banting, '01, 100.
 Baptists, '98, 86; '99, 102; '00, 109; '01, 100.
 Baptists, German, '98, 87.
 Baptist Young People's Union of America, '98, 87; '99, 103; '00, 109; '01, 101.
 Bar Association, American, '99, 103; '00, 109; '01, 102.
 Barattieri, General Oreste, '01, 102.
 Barbados, '98, 87; '99, 103; '00, 110; '01, 102.
 Barber Shops, '98, 87; '99, 104; '00, 110.
 Barbier, Paul Jules, '01, 102.
 Barbour, John Humphrey, '00, 110.
 Baring-Gould, Sabine, '98, 88.
 Barites, '99, 104; '00, 110.
 Barley, '98, 88; '99, 104; '00, 111; '01, 102.
 Barnard, George Grey, '99, 104.
 Barnard, Henry, '00, 111.
 Barnard College, '00, 112; '01, 103.
 Barnado's Homes, '98, 89; '00, 112.
 Bar of the City of New York, the Association of the, '99, 104; '00, 112; '01, 103.
 Baron de Hirsch Fund, '98, 89; '99, 104; '00, 112; '01, 103.
 Barres, Maurice, '98, 89.
 Barrett, James, '00, 113.
 Barrett, John, '99, 105.
 Barrie, James Matthew, '00, 113.
 Barrios, José Marie Reyna, '98, 89.
 Barry, Charles, '00, 113.
 Bartlett, Samuel Colcord, '98, 89.
 Bartol, Cyrus Augustus, '00, 113.
 Barton, Clara, '98, 90.
 Barton, Edmund, '01, 104.
 Barytes, '00, 113; '01, 104.
 Baseball, '98, 90; '99, 105; '00, 113; '01, 104.
 Baskerville, Charles, '01, 104.
 Basket Ball, '01, 105.
 Basutoland, '98, 90; '99, 105; '00, 114; '01, 105.
 Batchelder, Richard Napoleon, '01, 105.
 Batcheller System of Pneumatic Despatch, '98, 90.
 Bates, Erastus Newton, '98, 90.
 Bates, John Coalter, '00, 115.
 Baths, '98, 90; '99, 105; '00, 115; '01, 105.
 Batterson, James Goodwin, '01, 105.
 Batum Pipe Line, '01, 105.
 Bauxite, '99, 105; '00, 115; '01, 105.
 Bavaria, '98, 90; '99, 106.
 Baxter, Elisha, '99, 106.
 Bayard, Thomas Francis, '98, 91.
 Bayreuth Festivals, '98, 92.
 Beach, William Wither Bramston, '01, 105.
 Beaman, Charles Cotesworth, '00, 115.
 Beamish, Henry Hamilton, '01, 106.
 Beard, William Holbrook, '00, 115.
 Beardsley, Aubrey, '98, 92.
 Beaufort, Duke of, '99, 106.
 Beaupre, Quenay de, '99, 106.
 Bechuanaland, '98, 93; '99, 106; '00, 115; '01, 106.
 Becker, George Ferdinand, '01, 106.
 Becker, Karl Ludwig Friedrich, '00, 115.
 Becque, Henri Français, '99, 106.
 Becquerel Rays, '99, 106; '00, 116.
 Beecher, Charles, '00, 116.
 Beecher, Thomas Kinnicut, '00, 116.
 Beekman, Henry Rutgers, '00, 116.
 Beet Sugar, '98, 93; '00, 116; '01, 106.
 Behrends, Adolphus Julius Frederick, '00, 116.
 Behring, Emil Adolf, '01, 106.
 Behring Sea Dispute, '98, 93; '99, 106; '00, 117.
 Belgium, '98, 94; '99, 106; '00, 117; '01, 106.
 Bellamy, Edward, '98, 97.
 Belize, '99, 111; '00, 121; '01, 108.
 Belknap, Charles, '01, 108.
 Bell, James Franklin, '00, 121.
 Bell, Robert, '01, 109.
 Bellerose, '99, 112.
 Beloochistan, or Beluchistan, '98, 97; '99, 112; '00, 121; '01, 109.
 Beltrami, Eugenio, '00, 121.
 Benedetti, Vincent, '00, 121.
 Ben Hur, '98, 98.
 Bennett, Edmund H., '98, 98.
 Benoit, Pierre Leopold Leonard, '01, 109.
 Beresford, Lord Charles, '99, 112.
 Bering Sea, '00, 122.
 Bermuda, '98, 98; '99, 112; '00, 122; '01, 109.
 Bernard, Sir Charles Edward, '01, 109.
 Bernhardt, Sarah, '01, 109.

- Berriozabal, Felipe B., '00, 122.
 Berry, Rev. Charles Albert, '99, 113.
 Berthelot, Pierre Eugène Marcelin, '01, 110.
 Bertillon, Alphonse, '98, 98.
 Bertrand, Joseph Louis Francis, '00, 122.
 Besant, Sir Walter, '01, 110.
 Bessemer, Sir Henry, '98, 98.
 Bessonles, Rt. Rev. Mgr. August, '01, 111.
 Betts, George Frederick, '98, 98.
 Betz, Franz, '00, 123.
 Beveridge, Albert J., '99, 113.
 Bible Society, American, '99, 113; '00, 123; '01, 111.
 Bibliographical Society of London, '98, 99.
 Bicycle Paths, '98, 99.
 Bicycling, '98, 99; '99, 113; '00, 123; '01, 111.
 Bidwell, John, '00, 123.
 Biedermann, Karl, '01, 111.
 Billiards, '98, 99; '99, 113; '00, 123; '01, 111.
 Billot, Jean Baptiste, '98, 99; '99, 114.
 Bimetallism, '98, 99; '00, 123.
 Bingham, John Arende, '00, 123.
 Biological Stations, '98, 103; '99, 114; '00, 123; '01, 111.
 Biology, '98, 103; '99, 114; '00, 123; '01, 111.
 Biology, Progress of, During the 19th Century, '00, 967.
 Bird Protection, '98, 104; '99, 115; '00, 125; '01, 112.
 Birth-Rate, '98, 104; '01, 112.
 Bishop, Joel Prentiss, '01, 112.
 Bishops, '98, 104.
 Bismarck Archipelago, '98, 107; '99, 115; '00, 125; '01, 113.
 Bismarck-Schönhausen, Otto Edouard Leopold, Prince von, '98, 104.
 Bismarck-Schönhausen, Wilhelm Albrecht Otto, '01, 113.
 Bismuth, '98, 107.
 Bismutose, '01, 113.
 Bispham, David S., '98, 107.
 Bizzozero, Giulio, '01, 113.
 Black, William, '98, 107.
 Blackburn, Joseph C. S., '00, 125.
 Black Lead, '00, 125; '01, 113.
 Blackmore, Richard Doddridge, '00, 125.
 Blaikie, William Garden, '99, 116.
 Blair, Charles W., '99, 116.
 Blair, John Instey, '99, 116.
 Blanchard, Emilie, '00, 126.
 Blanco, A. Guzman, '99, 116.
 Bland, Richard Parks, '99, 116.
 Blandin, John J., '98, 108.
 Blauvelt, Charles F., '00, 126.
 Blepharoplast, '98, 108.
 Blind, Education of, '98, 108.
 Bliss, Cornelius Newton, '98, 108.
 Blodgett, Lorin, '01, 113.
 Blomfield, Sir Arthur William, '99, 117.
 Bluestone, '98, 108.
 Blumenthal, Leonhard, '00, 126.
 B'nai B'rith, Improved Order of, '98, 108.
 B'nai B'rith, Independent Order of, '98, 108.
 Board of Health, '98, 108.
 Boat-Racing, '98, 108; '99, 117; '00, 127; '01, 113.
 Boas, Franz, '00, 127.
 Boborykin, Pyotr Dmitriyevich, '00, 127.
 Bockum-Dolffs, Florens Heinrich von, '99, 117.
 Boecklin, Arnold, '01, 113.
 Boers, '98, 109; '99, 117; '00, 128; '01, 113.
 Bohemia, '98, 109; '99, 118; '00, 128.
 Boissadefre, Le Mouton de, '98, 109.
 Bokhara, '98, 110; '99, 119; '00, 128; '01, 113.
 Bollvia, '98, 110; '99, 119; '00, 128; '01, 113.
 Bonaparte, Napoleon, '98, 111.
 Bonaparte, Napoleon Charles Gregorie Jacques Philippe, '99, 121.
 Bond, Edward Augustus, '98, 111.
 Bonheur, Marie Rosalie (Rosa), '99, 121.
 Bonner, Robert, '99, 122.
 Booth, Henry Matthias, '99, 123.
 Borax, '98, 111; '99, 123; '00, 131; '01, 115.
 Borneo, '98, 112; '99, 123; '00, 131; '01, 115.
 Bornier, Vicomte Henri de, '01, 116.
 Bornu, '98, 112; '99, 124; '00, 132.
 Boron, '98, 112.
 Bosnia and Herzegovina, '98, 112; '99, 124; '00, 132; '01, 116.
 Boston, '98, 113.
 Boston Public Library, '99, 124; '00, 133; '01, 116.
 Botanical Gardens, '98, 113.
 Botanical Society of America, '98, 113; '01, 117.
 Botany, '98, 113; '99, 125; '00, 133.
 Botha, Louis, '00, 134.
 Bottego Expedition, '99, 131.
 Boulton, Charles Arkoll, '99, 131.
 Bounties on Exports, '98, 122.
 Bourgeois, Leon Victor Auguste, '99, 131.
 Bourget, Paul, '98, 123.
 Boutelle, Charles Addison, '01, 117.
 Bowdoin College, '98, 123; '99, 131; '00, 134; '01, 117.
 Bowen, George Ferguson, '99, 131.
 Bowen, Herbert Wolcott, '99, 131.
 Bowling, '99, 132; '00, 135; '01, 117.
 Boxers, '00, 135.
 Boxing, '01, 117.
 Boxing and Wrestling, '99, 132; '00, 135.
 Boyd, Andrew Kennedy Hutchinson, '99, 132.
 Boyd, David French, '99, 132.
 Boyle, Sir Courtenay, '01, 117.
 Boyle, Robert, '99, 132.
 Boys' Brigade, '98, 124.
 Boysset, Charles, '01, 117.
 Brabant, Edward Yewd, '00, 135.
 Bradbury, James Ware, '01, 117.
 Bradford, '98, 124.
 Bradford, Arthur D., '99, 132.
 Braine, Daniel Lawrence, '98, 124.
 Brandenburg, '99, 133.
 Brandes, George Morris Cohn, '99, 133.
 Brault, P. M., '99, 133.
 Brazil, '98, 124; '99, 133; '00, 135; '01, 118.
 Brema, Marie, '99, 136.
 Bremen, '98, 129; '99, 136.
 Bretschneider, Dr. E., '01, 120.
 Brewer, Mark Spencer, '01, 120.
 Brice, Calvin Stewart, '98, 129.
 Bricks, '98, 130; '99, 136; '00, 139.
 Bridge, John, '00, 139.
 Bridge-Building, '00, 139.
 Bridges, '98, 130; '99, 136; '01, 120.
 Bridgman, Frederick Arthur, '99, 137.
 Briggs, Charles Augustus, '99, 137.
 Briggs, Frank A., '98, 133.
 Bright, Jacob, '99, 133.
 Bright, William, '01, 121.
 Brin, Benedetto, '98, 133.
 Brinton, Daniel Garrison, '99, 138.
 Brisson, Eugène Henri, '98, 133.
 Bristol, '98, 133.
 B'rith Abraham Order, '98, 133.
 British and Foreign Anti-Slavery Society, '98, 133.
 British Army, '98, 133.
 British Association for the Advancement of Science, '98, 133; '99, 138; '00, 141; '01, 122.
 British Central Africa, '98, 134; '99, 138; '00, 142; '01, 123.
 British Central Africa Protectorate, '98, 134; '99, 139; '00, 142; '01, 123.
 British Columbia, '98, 134; '99, 139; '00, 142; '01, 123.
 British East Africa, '01, 124.
 British Guiana, '98, 134; '99, 139; '00, 143; '01, 124.
 British Honduras, or Belize, '98, 135; '99, 139; '00, 144; '01, 124.
 British Medical Association, '98, 135.
 British Museum, '98, 135; '99, 140; '00, 144.
 British Navy, '98, 135.
 British North Borneo, '98, 135; '99, 140; '00, 145; '01, 125.
 British School at Athens, '98, 135.
 British South Africa Company, '98, 135.
 Broad Irrigation, '98, 138.
 Brock, Thomas, '01, 126.
 Broderick, William St. John Fremantle, '98, 138.
 Brogden, Curtis Hooks, '01, 125.
 Broglie, Jacques Victor Albert, Duc de, '01, 125.
 Bromocoll, '00, 145.
 Brooke, John R., '98, 138.
 Brooklyn Institute of Arts and Sciences, '98, 138; '99, 140; '00, 145; '01, 126.
 Brosboll, Johan Carl Christian, '00, 145.
 Brosius, Marriott, '01, 126.

- Brotherhood of Andrew and Philip, '98, 138; '00, 146; '01, 126.
 Brotherhood of St. Andrew, '98, 138; '01, 126.
 Brotherhood of the Kingdom, '98, 139.
 Brothers of Nazareth, '98, 139.
 Brown, John Wesley, '00, 146.
 Brown, Thomas McKee, '98, 139.
 Brown University, '98, 139; '99, 140; '00, 146; '01, 126.
 Browne, Sir Samuel James, '01, 127.
 Brozilk, Wenceslas, '01, 127.
 Bruce, Alexander Balmain, '99, 140.
 Bruce, Blanche K., '98, 139.
 Bruce, Catherine Wolfe, '00, 147.
 Bruce, Henry Le Geyt, '99, 141.
 Brumby, Thomas Mason, '99, 141.
 Brunel, '98, 139; '99, 141; '00, 147; '01, 127.
 Brunetière, Ferdinand, '98, 139.
 Brunswick, '98, 139; '99, 141.
 Brussels, '98, 140.
 Bryan, William Jennings, '99, 141; '00, 147.
 Bryn Mawr College, '00, 147; '01, 127.
 Buberl, Casper, '99, 141.
 Bubonic Plague, '98, 140; '99, 142; '00, 148; '01, 127.
 Buchanan, Robert Williams, '01, 127.
 Buchheim, Charles Adolphus, '00, 148.
 Büchner, Friedrich Karl Christian, '99, 142.
 Buckalew, Charles R., '99, 142.
 Buckwheat, '98, 140; '99, 142; '00, 148; '01, 128.
 Buddhism, '98, 141.
 Buell, General Don Carlos, '98, 141.
 Buenos Ayres, '00, 148.
 Building Stones, '98, 141; '99, 143; '00, 148; '01, 128.
 Bulgaria, '98, 141; '99, 143; '00, 149; '01, 128.
 Buller, Redvers Henry, '99, 144; '00, 151.
 Billow, Bernhard von, '99, 144; '00, 151.
 Bunce, Francis Marvin, '01, 130.
 Bunce, John Thackray, '99, 146.
 Bunsen, Robert William, '99, 146.
 Bureau of American Ethnology, '98, 143; '99, 145; '00, 152.
 Bureau of Animal Industry, '00, 152.
 Burgess, A. M., '98, 143.
 Burgess, Rt. Rev. Alexander, '01, 130.
 Burma, '98, 143; '99, 145; '00, 152; '01, 130.
 Burne-Jones, Edward Colly, '98, 144.
 Burns, Alexander, '00, 152.
 Burns, William, '98, 144.
 Burton, Frederic William, '00, 152.
 Busiel, Charles Albert, '01, 131.
 Bute, John Patrick Crichton Stuart, '00, 152.
 Butler, Charles, '98, 144.
 Butler, Mathew Calbraith, '98, 145.
 Butler, Nicholas Murray, '01, 131.
 Butler, William, '99, 146.
 Butt, Clara, '99, 146.
 Butterfield, Daniel, '01, 131.
 Butterfield, William, '00, 153.
 Butterfield, Willshire, '99, 146.
 Butterworth, Benjamin, '98, 145.
 Buttons, '00, 153.
 Byrnes, Thomas Joseph, '98, 145.
 Cable, George Washington, '01, 132.
 Cacao, '99, 146.
 Calne, Thomas Henry Hall, '01, 132.
 Caird, John, '98, 146.
 Calro, '98, 146.
 Calsson Disease, '99, 146.
 Calcium Carbide, '99, 147.
 Calcutta, '98, 146; '99, 147.
 Calderon, Philip Hermogenes, '98, 146.
 Calentura, '99, 147.
 California, '98, 146; '99, 147; '00, 153; '01, 132.
 California, University of, '98, 149; '99, 150; '00, 157; '01, 135.
 Calvé, Emma, '99, 150.
 Cambodia, '98, 149; '99, 151; '00, 157; '01, 135.
 Cambon, Jules Martin, '98, 149.
 Cameron, Malcolm Cohn, '98, 149.
 Cameron, Roderick William, '00, 158.
 Cameroun, '98, 149; '99, 151; '00, 158; '01, 136.
 Campbell-Bannerman, Henry, '98, 150; '99, 151.
 Campbellites, '98, 150; '01, 136.
 Camplon, Hubert, '00, 158.
 Campoamar y Campoosorio, Ramon de, '01, 136.
 Campos, Arsenio Martinez, '00, 158.
 Canada, '98, 150; '99, 151; '00, 159; '01, 137.
 Canals, '98, 154; '99, 158; '00, 163; '01, 143.
 Canals in New York State, '01, 145.
 Canaries, or Canary Islands, '98, 160; '99, 158; '00, 170; '01, 146.
 Cancer, '98, 160; '99, 159; '00, 170; '01, 147.
 Candia, '98, 160; '99, 159; '00, 171; '01, 147.
 Cannon, George Q., '01, 147.
 Canoeing, '00, 171; '01, 147.
 Cantilever Bridges, '98, 160.
 Canton, '00, 171.
 Cantwell, Nicholas, '99, 159.
 Cape Colony, '98, 160; '99, 159; '00, 171; '01, 148.
 Cape-to-Cairo, '98, 163; '99, 162; '00, 175; '01, 151.
 '98, 163; '99, 162; '00, 175; '01, 151.
 Cape Verde Islands, '98, 163; '99, 164; '00, 177; '01, 151.
 Caprivi de Caprara de Montecucculi, '99, 164.
 Capron, Allyn, '98, 163.
 Carbon Di-Oxide, '98, 163.
 Carborundum, '98, 164; '99, 166.
 Cardinal, '98, 164; '99, 166; '00, 177; '01, 151.
 Carey Act, '98, 166.
 Carleton, Henry Alexander, '00, 177.
 Carlisle, Chichester Samuel Parkinson, '98, 166.
 Carlos, Don, '99, 166.
 Carnegie, Andrew, '99, 166; '00, 177; '01, 152.
 Carnegie Institution, '01, 152.
 Carnegie Museum, '98, 166; '00, 178.
 Caroline, Amelia, '01, 153.
 Caroline Islands, '98, 166; '99, 166; '00, 178; '01, 153.
 Carolus-Duran, '99, 166.
 Carpenter, Charles C., '99, 166.
 Carpenter, Francis Bicknell, '00, 178.
 Cars, '99, 167; '00, 178.
 Carte, D'Oyly, '01, 153.
 Carter, Frederick Bowker Terrington, '00, 178.
 Carthage, '98, 166.
 Cartwright, Richard, '98, 166.
 Casablanca, Manuel, '01, 154.
 Cascade Tunnel, '00, 178.
 Cascajares y Azara, Antonio Maria, '01, 154.
 Casimir-Perier, Jean Paul Pierre, '98, 166.
 Cassatt, Alexander Johnston, '01, 154.
 Castelar, Emilio, '99, 167.
 Castle, Egerton, '01, 154.
 Castner, Hamilton Young, '99, 167.
 Castro, General Cipriano, '01, 154.
 Catargi, Lascar, '99, 168.
 Cathode Rays, '98, 167.
 Catholic Benevolent League, '98, 167.
 Catholic Church, '01, 154.
 Catholic Colleges of the United States, Conference of the, '00, 178; '01, 154.
 Catholic Knights of America, '98, 167.
 Catholic Mutual Benefit Association, '98, 167.
 Catholic Summer School of America, '00, 179; '01, 154.
 Catholic University, '00, 179; '01, 155.
 Cattell, James McKeen, '01, 155.
 Cattell, William C., '98, 167.
 Caucasus, '98, 167; '99, 167; '00, 179.
 Cavan, Frederic Edward Gould Lambart, '00, 179.
 Cavaignac, Jacques Marie Eugène Godefroy, '98, 167.
 Cavallotti, Felice Carlo Emanuele, '98, 167.
 Cavendish, '99, 168.
 Cavite Fever, '01, 155.
 Cazin, Jean Charles, '01, 156.
 Celebes, '98, 168; '99, 168; '00, 179; '01, 156.
 Cell (Vegetable), '98, 168.
 Cement, '98, 168; '99, 168; '00, 180.
 Census of the United States, '98, 168; '99, 168; '00, 180; '01, 156.
 Central America, '98, 169; '99, 172; '00, 183; '01, 156.
 Central Asia, '98, 171; '99, 172.
 Central Heating Stations, '00, 184.
 Centrosome, '98, 172.
 Century, Nineteenth, '00, 965.
 Ceram, '99, 172.
 Cervera y Topete, Pascual de, Conde de Jerez, Marquis de Santa Ana, '98, 172.

- Ceylon, '98, 172; '99, 172; '00, 184; '01, 187.
 Chaffee, Adna Romanza, '99, 173; '00, 185.
 Chagos Islands, '98, 173.
 Chalmers, James Ronalds, '98, 173.
 Chamberlain, Joseph, '99, 173; '00, 168.
 Chamberlain, Mellen, '00, 186.
 Channing, William Ellery, '01, 187.
 Chanoine, General, '98, 173.
 Chapelle, Placide Louis, '99, 173; '00, 186.
 Chapleau, Joseph Adolphe, '98, 173.
 Charcoal, '98, 173.
 Charities, '98, 173; '99, 173; '00, 186.
 Charity Organization, '01, 188.
 Charity Organization Society, '98, 180; '99, 176; '00, 186.
 Charleston Exposition, '01, 163.
 Charlton, John, '98, 180.
 Charpentier, Gustave, '00, 186.
 Chatin, Adolphe, '01, 163.
 Chaudordy, Jean Baptiste Alexandre Damaze, '99, 177.
 Chautauqua Assembly, '98, 180; '99, 177; '00, 186; '01, 163.
 Chemical Precipitation, '98, 180.
 Chemical Society, American, '98, 180; '99, 177; '00, 187.
 Chemistry, '99, 177; '00, 187; '01, 163.
 Chemistry, Progress of, During the Nineteenth Century, '00, 968.
 Chennevières, Charles Philippe de, '99, 180.
 Cheney, Person Colby, '01, 167.
 Cherbulies, Victor, '99, 180.
 Chess, '98, 180; '99, 181; '00, 190; '01, 167.
 Chicago Architectural Club, '98, 180.
 Chicago Drainage Canal, '98, 181; '99, 181; '00, 191.
 Chicago, Election in, '99, 181.
 Chicago, University of, '98, 181; '99, 181; '00, 191; '01, 167.
 Chickering, George Harvey, '99, 181.
 Chifu, '00, 192.
 Children's Aid Society, '98, 181; '99, 182; '00, 192; '01, 168.
 Chile, '98, 181; '99, 182; '00, 192; '01, 169.
 China Clay, '99, 184.
 Chinese Empire, '98, 184; '99, 184; '00, 196; '01, 171.
 Ching, Prince, '00, 216.
 Chiniquy, Charles Paschal Telesphore, '99, 195.
 Chin Kiang, '00, 216.
 Chitral, '98, 195.
 Chittenden, Lucius Eugene, '00, 216.
 Chitty, Joseph William, '99, 195.
 Chloreton, '99, 195.
 Choate, Joseph Hodges, '98, 195; '99, 196.
 Cholera, '98, 195; '00, 216; '01, 181.
 Cholera Infantum, '99, 196.
 Cholmondeley, Miss Mary, '00, 216.
 Chosen Friends, '98, 195.
 Christadelphians, The, '98, 196.
 Christian and Missionary Alliance, '98, 195; '99, 196; '01, 181.
 Christian Catholic Church, '98, 195; '00, 216; '01, 181.
 Christian Connection, '98, 196.
 Christian Endeavor, '98, 196.
 '99, 196; '00, 216; '01, 181.
 Christians, '99, 196; '00, 217; '01, 182.
 Christian Science, '98, 196; '99, 196; '00, 217; '01, 182.
 Christian Science (Reformed), '00, 217; '01, 182.
 Christian Union Churches, '98, 196.
 Christian Victor, '00, 217.
 Christmas Island, '01, 182.
 Chromic Iron Ore, '99, 197; '00, 217; '01, 183.
 Church, Frederic Edwin, '00, 218.
 Church of Christ, Scientist, '99, 198; '00, 218; '01, 183.
 Church of Ireland, '99, 198; '00, 218.
 Church Temperance Legion, '98, 196.
 Church Temperance Society, '98, 197; '99, 198.
 Churchill, John Wesley, '00, 218.
 Churchill, Lady Randolph, '99, 198.
 Churchill, Winston, '99, 198; '01, 183.
 Churchill, Winston Leonard Spencer, '99, 198; '00, 218.
 Cilley, Bradbury Longfellow, '99, 198.
 Cincinnati, Society of the, '99, 198; '00, 218; '01, 183.
 Cirrhosis, '01, 183.
 Civic Federation, National, '01, 183.
 Civil Engineers, American Society of, '98, 197; '99, 198; '00, 218.
 Civil Service Reform, '99, 198; '01, 183.
 Civil Service Reform League, National, '00, 219.
 Clairvoyance, '98, 197.
 Clapp, Alexander Huntington, '99, 198.
 Clark Cell, '99, 199.
 Clark, Jonas Gilman, '00, 219.
 Clark, Latimer, '98, 197.
 Clark, William A., '99, 199; '00, 219.
 Clarke, Frank Wigglesworth, '00, 219.
 Clarke, George Calvert, '00, 219.
 Clarke, John Sleeper, '99, 199.
 Clarke, Mary Victoria Cowden, '98, 197.
 Clarke, Robert, '99, 199.
 Clarke, Thomas Curtis, '01, 185.
 Clark University, '00, 220; '01, 185.
 Clary and Aldringen, Carlos, '99, 199.
 Clay, '98, 197; '99, 199; '00, 220; '01, 185.
 Claypole, Edward W., '01, 186.
 Clearing House, '98, 197.
 Cleary, James Vincent, '98, 197.
 Clemenceau, Dr. Georges, '98, 198.
 Clement, Nathaniel H., '99, 200.
 Clifden, Leopold George Frederick Agar-Ellis, '99, 200.
 Climatological Association, American, '98, 198; '99, 200; '00, 220.
 Cluseret, Gustave Paul, '00, 220.
 Coal, '98, 198; '99, 200; '00, 221; '01, 186.
 Coal Smoke, '00, 224.
 Coats, Joseph, '99, 202.
 Cobalt, '99, 202; '00, 226; '01, 188.
 Cocaine Habit, '00, 225; '01, 188.
 Cochín-China, '98, 198; '99, 202; '00, 225; '01, 188.
 Cochín-China Diarrhœa, '01, 188.
 Cochín-China, Lower, '99, 202.
 Cochran, John, '98, 198.
 Cocoa-nut Palm Products, '00, 225.
 Codman, John, '00, 226.
 Coffee, '99, 202; '00, 226; '01, 188.
 Coghlan, Charles, '99, 204.
 Coghlan, Joseph Bullock, '99, 204.
 Coinage, '98, 199; '98, 807; '99, 809; '00, 896.
 Coins, Value of Foreign, '98, 199; '99, 204; '00, 226; '01, 189.
 Colr, '00, 228.
 Coke, '99, 206; '00, 228; '01, 190.
 Coke Oven Gas, '01, 191.
 Colenso, William, '99, 206.
 Coleridge-Taylor, Samuel, '00, 228.
 College Entrance Examinations, '01, 191.
 College Settlements, '98, 200; '99, 206; '00, 826.
 Colleges, '00, 906; '01, 191.
 Colleges, Gifts to, '00, 906; '01, 191.
 Collett, John, '99, 207.
 Colomb, Philip Howard, '99, 207.
 Colombia, '98, 202; '99, 207; '00, 229; '01, 191.
 Colonial Dames of America, '98, 204; '99, 210; '00, 232.
 Colonial Dames of America, National Society of, '98, 204; '99, 210; '00, 232.
 Colonial Wars, Society of, '99, 210; '00, 232.
 Colonies, '99, 210; '00, 232; '01, 193.
 Colonization, Progress of, During the Century, '00, 1018.
 Colorado, '98, 204; '99, 215; '00, 240; '01, 193.
 Colorado Formation, '99, 217.
 Colorado State Historical and Natural Society, '99, 217.
 Colored Hearing, '00, 242.
 Colored Masonic Bodies, '98, 206.
 Colored Methodists, '98, 206; '99, 217; '00, 242; '01, 196.
 Colton, Gardner Quincy, M.D., '98, 206.
 Columbia, British, '98, 206; '99, 217; '00, 142.
 Columbia University, '98, 207; '99, 218; '00, 242; '01, 196.
 Comédie Française, '98, 207.
 Comets, '98, 207; '99, 218; '00, 243; '01, 197.
 Commerce, Progress of, During the Century, '00, 996.
 Commerell, Sir John Edmund, '01, 197.

- Communications, Progress of, During the 19th Century, '00, 999.
- Commercial Travellers' Home, Association of America, '98, 207.
- Comparative Literature Society, '98, 207.
- Concrete, '99, 218.
- Condenser, Absorption in, '98, 207.
- Conduit Electric Railways, '98, 207.
- Conger, Edwin H., '00, 243.
- Conger, Omar D., '98, 209.
- Congo Free State, '98, 209; '99, 218; '00, 243; '01, 197.
- Congregationalists, '98, 212; '99, 222; '00, 246; '01, 199.
- Congregationalist Methodist Church, '98, 212; '99, 222; '00, 246; '01, 199.
- Congregational National Council, '98, 212; '99, 222; '00, 246.
- Congressional Library, '98, 212; '99, 222; '00, 246; '01, 200.
- Coniferae, '98, 216.
- Connaught and Strathearn (Prince Arthur William Patrick Albert), '99, 222.
- Connecticut, '98, 213; '99, 223; '00, 247; '01, 200.
- Conrad, Joseph, '00, 248.
- Constantan, '98, 215.
- Constitution of Matter, '98, 215.
- Consumers' League, '98, 215; '99, 224; '00, 249.
- Consumption, '98, 215; '99, 226; '00, 250; '01, 203.
- Continental Literature, Progress of During the Century, '00, 980.
- Conway, Sir William Martin, '01, 203.
- Convict Labor, '00, 250.
- Cook, Clarence Chatham, '00, 251.
- Cook Islands, '00, 251.
- Cook, John Mason, '99, 226.
- Cook, Joseph, '01, 203.
- Cooley, Thomas McIntyre, '98, 215.
- Cooper, Job Adams, '99, 226.
- Cooper, Thomas Sidney, R. A., '98, 215.
- Cooper Union for the Advancement of Science and Art, '98, 216; '99, 226; '00, 251; '01, 204.
- Co-operation, '01, 204.
- Copper, '98, 216; '99, 226; '00, 251; '01, 205.
- Copra, '00, 252.
- Copyright, International, '00, 252.
- Coquelin, Benoit Constant, '01, 206.
- Correa, '98, 216; '99, 227; '00, 253; '01, 206.
- Corelli, Marie, '00, 255.
- Corey, Charles Henry, '99, 229.
- Corinth, '98, 219.
- Corn, '98, 219; '99, 230; '00, 256; '01, 209.
- Cornell University, '98, 219; '99, 231; '00, 257; '01, 211.
- Cornu, Maxime, '01, 212.
- Coronium, '98, 220.
- Corporations, '00, 258; '01, 212.
- Correa, Joao Arthur de Souza, '00, 258.
- Correa, M., '99, 232.
- Costa Rica, '98, 220; '99, 232; '00, 258; '01, 212.
- Costelloe, Benjamin, '99, 234.
- Cotton and the Cotton Industry, '98, 222; '99, 234; '00, 260; '01, 212.
- Cotton, Arthur Thomas, '99, 237.
- Cotton, Frederick Conyers, '01, 215.
- Coues, Elliott, '99, 237.
- Couldock, Charles Walter, '98, 228.
- Council of Jewish Women, '98, 228; '99, 465; '00, 508.
- Court Tennis, '00, 263.
- Cowen, Frederick Hymen, '99, 238.
- Cox, Jacob Dolson, '00, 263.
- Cox, Robert, '99, 238.
- Coxwell, Henry Tracy, '00, 263.
- Craig, Thomas, '00, 263.
- Cramer, Rev. Michael John, D.D., '98, 228.
- Cramp, Charles Henry, '99, 238.
- Crane, Stephen, '00, 264.
- Crane, Walter, '99, 238.
- Cranford, John Walter, '99, 238.
- Cravath, Erastus Milo, '00, 264.
- Crelighton, Rt. Rev. Mandell, '01, 215.
- Cremation of the Dead, '98, 228; '99, 238; '00, 264; '01, 215.
- Cremation of Garbage, '98, 229.
- Crespo, Joaquin, '98, 229.
- Crete, '98, 229; '99, 240; '00, 265; '01, 216.
- Cretinism, '01, 217.
- Cricketer, '99, 241; '00, 266; '01, 218.
- Crime, '98, 230; '99, 241; '00, 266; '01, 218.
- Crispi, Francesco, '98, 237; '01, 221.
- Croatia and Slavonia, '98, 237; '99, 244; '00, 269; '01, 221.
- Croizette, Sophie Alexandrine, '01, 221.
- Croker, Richard, '99, 244; '00, 270.
- Croly, Jane Cunningham, '01, 222.
- Cronje, Piet, '00, 271.
- Cropsey, Jasper Francis, '00, 271.
- Croquet-Roque, '99, 244; '00, 271; '01, 222.
- Crosby, Felce, '99, 244.
- Crossman, Sir William, '01, 222.
- Croup, '98, 238; '99, 244.
- Crozier, William, '99, 244.
- Cruger, Stephen Van Rensselaer, '98, 238.
- Crump, Frederick Octavius, '00, 272.
- Cryolite, '01, 222.
- Crystal-Gazing, '98, 238.
- Cuba, '98, 238; '99, 245; '00, 272; '01, 222.
- Cuban Educational Association, '98, 242.
- Cuban Fever, '98, 242; '99, 251.
- Culbertson, Charles A., '99, 251.
- Culbertson, David Browning, '00, 280.
- Cullis, General John B., '98, 243.
- Cullum, Shelby Moore, '98, 243.
- Cumberland Presbyterians, '98, 243; '99, 251; '00, 281; '01, 232.
- Cumberland Presbyterian Church (Colored), '99, 252; '00, 281.
- Cunliffe, George Gordon, '00, 281.
- Curacao, '98, 243; '99, 252; '00, 281; '01, 233.
- Curling, '99, 252; '00, 281; '01, 233.
- Currency Reform, '98, 243; '99, 252; '00, 282; '01, 233.
- Currier, Moody, '98, 254.
- Curtis, William B., '00, 284.
- Curzon, George Nathaniel, '98, 254.
- Cushing, Frank Hamilton, '00, 285.
- Cycadaceae, '98, 254.
- Cycling, '99, 254; '00, 285; '01, 233.
- Cyprus, '98, 254; '99, 254; '00, 285; '01, 233.
- Cyrano de Bergerac, '98, 254.
- Cytology (Vegetable), '98, 254.
- Czarevitch, '99, 254.
- Czechs, '98, 254; '99, 254; '00, 286; '01, 234.
- Da Costa, Jacob M., '00, 286.
- Dahlgren, Mrs. Madeline Vincent, '98, 255.
- Dahomey, '98, 255; '99, 254; '00, 286; '01, 234.
- Dairying, '99, 255; '01, 234.
- Daly, Augustin, '99, 256.
- Daly, Charles Patrick, '99, 257.
- Daly, Marcus, '00, 286.
- Daly, William D., '00, 287.
- Daly, William Hudson, '01, 236.
- Dames of the Revolution, '98, 255.
- Dams, '98, 256; '99, 258; '00, 287; '01, 236.
- Danford, Lorenzo, '99, 258.
- Danforth, George F., '99, 259.
- Danish West Indies, '99, 259; '00, 288; '01, 236.
- D'Annunzio, Gabriele, '98, 28; '00, 289.
- Danube, Navigation of the, '98, 257.
- Darfur, '98, 257; '99, 259; '00, 290.
- Darlington, Smedley, '99, 259.
- Dartmouth College, '98, 257; '99, 259; '00, 290; '01, 237.
- Darwinism, '99, 259; '00, 290.
- Dashiell, Robert B., '99, 259.
- Date Line, International, '98, 257; '99, 260.
- Daughters of the American Revolution, '98, 257; '99, 260; '00, 290.
- Daughters of the Cln nati, '98, 257.
- Daughters of Cuba, '98, 257.
- Daughters of the Holland Dames, '98, 257.
- Daughters of the King, The, '98, 257; '99, 260; '00, 290; '01, 237.
- Daughters of the Revolution, '98, 258; '99, 260; '00, 290.
- Daunt, William, '99, 260.
- Davenport, Fanny Lily Gipsy (Mrs. Melbourne McDowell), '98, 258.
- Davidson, Thomas, '00, 290.
- Davies, Louis Henry, '98, 258.
- Davies, Thomas A., '99, 260.
- Davin, Nicholas Flood, '01, 237.
- Davis, Charles W., '98, 258.

- Davis, Cushman Kellogg, '98, 258; '00, 291.
 Davis, Varina Anne ("Win-
 nie"), '98, 258.
 Dawson, A. J., '00, 292.
 Dawson, George Mercer, '01,
 238.
 Dawson, John William, '99,
 260.
 Day, William R., '98, 259; '99,
 261.
 Death-Rate, '98, 259; '01, 238.
 Deaths, '99, 261.
 De Goesbriand, Louis, '99,
 261.
 Delagoa Bay, '98, 259; '99,
 261; '00, 292.
 Delaware, '98, 259; '99, 262;
 '00, 292; '01, 238.
 Delbruck, Hans, '99, 263.
 Delcassé, Théophile, '99, 263.
 Delos, '98, 261.
 Del Puente, Giuseppe, '00,
 294.
 Delphi, '98, 261.
 Deluge, Babylonian Account
 of, '98, 261.
 Demange, Charles Gabriel
 Edgard, '98, 261; '99, 263.
 Democratic Clubs, National
 Association of, '99, 263; '00,
 295.
 Denby, Charles, '99, 263.
 Denderah, Egypt, '98, 261.
 Denmark, '98, 261; '99, 264;
 '00, 295; '01, 241.
 Denny, or D'Ennery,
 Adolphe Philippe, '99, 266.
 Density of Earth, '98, 262.
 Dental Association, National,
 '99, 266; '00, 297.
 Department Stores, '00, 297.
 Depew, Chauncey Mitchell,
 '99, 267.
 De Puy, William Harrison,
 '01, 244.
 Dermatological Association,
 American, '98, 263; '99, 267;
 '00, 297.
 Déroulède, Paul, '98, 263; '99,
 267; '00, 297.
 Desert, William Elie O'Con-
 nor Cuffe, '98, 263.
 Deschamps, Gaston, '00, 297.
 Deschanel, Paul Eugène
 Louis, '98, 263; '99, 267.
 Design, National Academy
 of, '99, 267; '00, 297; '01,
 244.
 Desjardins, Achille Arthur,
 '01, 244.
 Development of the Embryo,
 '98, 263.
 Development, '00, 297.
 De Wet, Christian, '00, 297.
 Dewey, George, '98, 264; '99,
 267; '00, 298.
 Dewey, Justin, '00, 298.
 Dhokhobortsi, '98, 265; '99,
 269; '00, 301.
 Dialect Society, American,
 '99, 270; '00, 298.
 Diamonds, '98, 265; '99, 270;
 '01, 244.
 Diarrhoea, '98, 266; '01, 244.
 Didon, Henri, '00, 298.
 Dielman, Frederick, '99, 270.
 Diet, '00, 298; '01, 244.
 Diet and Food, '98, 266; '99,
 270.
 Dingley, Nelson, Jr., '98, 266;
 '99, 270.
 Diphtheria, '98, 267; '99, 270;
 '00, 299; '01, 244.
 Dippel, Andreas, '99, 271.
 Disarmament, '99, 271.
 Disciples of Christ, '98, 268;
 '99, 271; '00, 299; '01, 245.
 Diseases of Plants, '98, 268.
 Disestablishment, '98, 268.
 Disinfection, '98, 268.
 Dispensary Abuse, '98, 268;
 '99, 271.
 Dispersion Formula, '98, 269.
 Distilling Ships, '98, 269.
 Distribution, '99, 272.
 Distribution of Animals, '98,
 269.
 District of Columbia, '98,
 271; '99, 272; '00, 299; '01,
 245.
 Djavad, Pasha, '00, 300.
 Dobson, William Charles
 Thomas, '98, 272.
 Dockery, General Thomas,
 '98, 272.
 Dodd, Moses W., '99, 272.
 Dodgson, Rev. Dr. Charles
 Lutwidge, M.A., '98, 272.
 Dole, Sanford Ballard, '98,
 272.
 Domestic Animals, '99, 272.
 Dominica, '98, 272; '99, 272;
 '00, 300; '01, 247.
 Dominican Republic, '98, 690;
 '99, 719; '00, 810; '01, 247.
 Donaldson, Thomas C., '98,
 273.
 Dongola, '98, 273.
 Donnelly, Ignatius, '01, 247.
 Doric Temple, '98, 273.
 Dormiol, '00, 300.
 Double Personality, '98, 273.
 Double Stars, '98, 273.
 Doukhoborts, or the Douk-
 hobors, '98, 265; '99, 269;
 '00, 301.
 Doumic, René, '98, 273.
 Dow, Lorenzo, '99, 273.
 Drainage, '98, 273; '99, 273.
 Drama, '99, 273; '00, 301; '01,
 247.
 Drawbridges, '98, 273; '99,
 276.
 Dredges, '99, 276.
 Dreyfus, Alfred, '98, 273; '99,
 277; '00, 306.
 Driven Wells, '98, 273.
 Droz, Numa, '99, 277.
 Drug Habit, '01, 251.
 Druids, '98, 273.
 Drumont, Edouard, '98, 274.
 Dry Docks, '99, 277.
 Drygalski, Eric Dagobert
 von, '01, 251.
 Duffield, John Thomas, '01,
 251.
 Duggan, James, '99, 278.
 Dun, Robert Graham, '00,
 306.
 Dunbar, Charles Franklin,
 '00, 306.
 Druses, '98, 274.
 Duclau, M., '98, 274.
 Dunant, Dr. Jean Henri, '01,
 251.
 Dunglison, Richard James,
 '01, 251.
 Dunkards, The, '98, 274; '99,
 278; '00, 306; '01, 251.
 Dunkin, Edwin, '98, 274.
 Dunne, Finley Peter, '99, 278.
 Duperré, Victor Auguste, '00,
 306.
 Dupuy, Charles, '98, 274.
 Dupuy de Lome, '98, 275.
 Duran, Emile Auguste Caro-
 lus, '99, 278.
 Duryea, Joseph Tuthill, D.D.,
 '98, 275.
 Dutch Borneo, '98, 112; '99,
 124; '00, 131.
 Dutch East Indies, '99, 278;
 '00, 306; '01, 251.
 Dutch Guiana, '98, 275; '99,
 279; '00, 307; '01, 252.
 Dutch Reformed Church, '00,
 306; '01, 252.
 Dwight Timothy, '98, 275;
 '99, 279.
 Dyer, Hermon, '00, 308.
 Dysentery, '00, 308.
 Earthquakes, '98, 276; '99,
 280; '00, 308; '01, 252.
 Earthwax, '00, 309.
 East Africa, '98, 276; '99, 280;
 '00, 309; '01, 253.
 East Africa, British, '98, 276;
 '99, 280; '00, 309; '01, 253.
 East Africa, German, '98,
 276; '99, 280; '00, 309; '01,
 253.
 East Africa, Portuguese, '98,
 277; '99, 280; '00, 309; '01,
 254.
 East Africa Protectorate, '98,
 277; '99, 281; '00, 310; '01,
 254.
 Eastwood, Benjamin, '99, 281.
 Eaton, Dorman B., '99, 281.
 Eaton, William Wallace, '98,
 277.
 Ebers, Dr. George Moritz,
 '98, 277.
 Eclipse Cycle, Stockwell's,
 and Eclipse, Solar, '01, 255.
 Eclipse of May 28, '00, 311.
 Economic Association, Ameri-
 can, '98, 282; '99, 282; '00,
 311; '01, 255.
 Ecology, '98, 279.
 Economics, Hospital, '99, 284.
 Economic Association, Imperi-
 al Free, '00, 312.
 Ecuador, '98, 279; '99, 284;
 '00, 314; '01, 256.
 Ecumenical Conference,
 Methodist, '01, 257.
 Eddis, Eben Upton, '01, 257.
 Eddy, Mary Baker Glover,
 '00, 315.
 Eddy, William W., '00, 315.
 Edgar, James David, '99, 286.
 Edgerton, Sydney, '00, 316.
 Edmunds, Paul Carrington,
 '99, 286.
 Education, '00, 316.
 Educational Association, Nation-
 al, '99, 286; '00, 316; '01,
 257.
 Education in the United
 States, '98, 281; '99, 286;
 '00, 316; '01, 257.
 Edward VII., '01, 264.
 Edwards, Arthur, '01, 264.
 Edwards, Thomas Charles,
 '00, 320.
 Eggleston, Thomas, '00, 320.
 Egypt, '98, 286; '99, 293; '00,
 320; '01, 264.
 Eickhoff, Anthony, '01, 267.
 Elbert, Samuel H., '99, 296.
 Elbe-Trave, '00, 324.
 Elche, Bust from, '98, 291.
 Electrical Engineering, '98,
 291; '99, 297; '00, 324; '01,
 267.
 Electric Carriage, '98, 292;
 '99, 297; '00, 324.
 Electrical Engineers, Ameri-
 can Institute of, '99, 297;
 '00, 325.
 Electric Elevators, '99, 297.
 Electric Fountains, '01, 268.
 Electricity, '99, 297; '00, 325.
 Electricity as an Anæsthe-
 tic, '98, 292.
 Electricity on Shipboard, '98,
 291.
 Electric Light and Power,
 '98, 292; '99, 297; '01, 268.
 Electric Power Transmis-
 sion, '01, 270.
 Electric Street Railways, '98,
 296; '99, 299; '00, 325.
 Electric Vehicles, '98, 300.

- Electric Welding of Street Railway Rails, '98, 300.
 Electrolysis of Gas and Water Mains, '98, 300; '99, 309; '01, 271.
 Electromagnetic Theory of Light, '98, 301.
 Electro-Therapeutic Association, American, '98, 301; '99, 303; '00, 329.
 Elements, '98, 301; '99, 303; '00, 329; '01, 272.
 Eleusis, '98, 301.
 Elevated Railways, '99, 303; '00, 329.
 Elevators, '99, 303.
 Elgar, Edward William, '99, 304; '00, 329.
 Eleventh Army Corps Association, '98, 301.
 Elliot, Samuel, LL.D., '98, 301.
 Elizabeth, Empress of Austria, '98, 301.
 Elks, Benevolent and Protective Order, '98, 302.
 Ellerbe, William Hazelden, '98, 304.
 Ellis, George Viner, '00, 329.
 Ellis, Thomas Edward, '99, 304.
 Elton, Charles Isaac, '00, 330.
 Embryology, '98, 302; '99, 304; '00, 330.
 Emeralds, '00, 330; '01, 272.
 Emigration, '98, 302.
 Employers' Liability, '98, 303; '00, 330.
 Empress of Austria, '98, 301.
 Endicott, William Crowninshield, '00, 330.
 Engineering, '98, 303; '99, 304; '00, 330; '01, 272.
 England, '98, 303; '99, 304; '00, 330; '01, 272.
 England, Church of, '98, 303; '99, 304; '00, 330; '01, 272.
 English and American Literature, Progress of, during the Century, '00, 982.
 Eno, Amos R., '98, 304.
 Enteric Fever, '98, 304; '01, 272.
 Enteritis, '98, 304.
 Entomology, '98, 304; '99, 306; '00, 330; '01, 272.
 Enzyme, '98, 304.
 Eocene, '98, 305.
 Ephesus, '98, 305.
 Epicar, '00, 332.
 Epidemic Influenza, '98, 305.
 Epilepsy, '01, 274.
 Epileptic Asylums and Colonies, '00, 332.
 Epileptics, '98, 305.
 Epileptic Colonies, '99, 308.
 Epitaph, '01, 275.
 Episcopal Church, '98, 306; '99, 309; '00, 332; '01, 275.
 Epworth League, '98, 306; '99, 309; '00, 332; '01, 275.
 Epworth League of the M. E. Church, South, '98, 306; '99, 309; '00, 333; '01, 275.
 Erckmann, Emile, '99, 309.
 Eritrea, or Erythra, '98, 306; '99, 309; '00, 333; '01, 275.
 Erlanger, Camille, '00, 333.
 Ermentrout, Daniel, '99, 310.
 Eros, '00, 333; '01, 275.
 Erysipelas, '98, 307.
 Errazuriz, Federico, '01, 275.
 Eschenhagen, Max, '01, 276.
 Esher, William Balliol Brett, '99, 310.
 Essex Institute, '98, 307.
 Esterhazy, Count Marie Charles Ferdinand Walsin, '98, 307; '99, 310.
 Etherion, '98, 308.
 Ethical Culture, Society for, '99, 310; '00, 333.
 Ethnology, '98, 308; '00, 333.
 Etruscan Civilization, Chronology, '98, 308.
 Eunatrol, '00, 333.
 Euphrates Valley Railway, '01, 276.
 Eupyrin, '00, 333.
 Europe, Flora of, '98, 308.
 Europe, Progress of, During the 18th Century, '00, 1004.
 Eustis, James Biddle, '99, 310.
 Evangelical Association, '98, 308; '99, 311; '00, 333; '01, 276.
 Evans, Robley D., '98, 308.
 Everts, William Maxwell, '01, 276.
 Everett, Charles Carroll, '00, 334.
 Everett, Erastus, '00, 334.
 Evolution, Theory of, '98, 308; '99, 311; '00, 334; '01, 277.
 Exmouth, Edward Fleetwood John Pellew, '99, 311.
 Expansion, Territorial, '99, 311; '00, 756.
 Expectoration, '98, 308; '01, 277.
 Experimental Psychology, '98, 308; '99, 311; '00, 334; '01, 277.
 Experiment Stations, State, '98, 308; '00, 334; '01, 277.
 Explorations, '99, 311; '00, 334 and 1016; '01, 277.
 Expositions, '01, 277.
 Eye, '99, 311.
 Eyre, Edward John, '01, 277.
 Faber, Baron Johann Lothar von, '01, 277.
 Fabian Society, '98, 308; '99, 311.
 Fabre, Ferdinand, '98, 308.
 Faed, Thomas, '00, 334.
 Fairbairn, Andrew Martin, '99, 311.
 Fairbairn, Robert Brinkerhoff, '99, 311.
 Fairbank, Calvin, '98, 309.
 Fairbanks, Charles Warren, '98, 309.
 Fairfax, Henry, '00, 334.
 Faith Cure, '99, 311; '00, 334.
 Falgüère, Jean Alexandre Joseph, '00, 334.
 Falk, Paul Ludwig Adalbert, '00, 335.
 Falkland Islands, '98, 309; '99, 311; '00, 335; '01, 277.
 Fallières, Clément Armand, '99, 312.
 Famine in India, '98, 414; '99, 431; '00, 467.
 Fane, Edmund Douglas Veitch, '00, 335.
 Farm Animals, '98, 309; '01, 278.
 Farmers' Alliance and Industrial Union, National, '99, 312.
 Farmers' Institute, '01, 278.
 Farrell, Thomas, '00, 335.
 Farrer, Baron, Sir Thomas Henry Farrer, '99, 312.
 Fatigue, '01, 278.
 Fauch, Helen, '98, 310.
 Faulkner, Charles James, '98, 310.
 Faunce, William Herbert Perry, '99, 312.
 Faure, François Felix, '98, 311; '99, 313.
 Fearn, J. Walker, '99, 313.
 Febiger, John Carson, '98, 311.
 Federated Malay States, '01, 278.
 Federation of Labor, American, '98, 311; '99, 314; '00, 335; '01, 278.
 Fee, John G., '01, 279.
 Feeble-Minded, Education of the, '98, 311; '99, 293.
 Feldspar, '98, 311; '01, 279.
 Fencing, '99, 314; '00, 337; '01, 279.
 Ferdinand I., '99, 314.
 Ferghana, '98, 312.
 Fermentation, '98, 312.
 Ferments, '98, 312.
 Fernando Po, '01, 280.
 Ferns, '98, 312.
 Fersan, '00, 337.
 Fertilization, Artificial, '00, 337; '01, 280.
 Fibich, Zdenko, '00, 337.
 Field Columbian Museum, '98, 312; '99, 316; '00, 337.
 Field, John, '99, 314.
 Field, Stephen Johnson, '99, 314.
 Field, Walbridge Abner, '99, 315.
 Fiji Islands, '98, 312; '99, 316; '00, 338; '01, 280.
 Filaria, '00, 338; '01, 280.
 Filters, '98, 312.
 Filtration, '99, 316.
 Finance, '98, 312; '99, 316; '00, 339; '01, 280.
 Financial Review of the Year, '01, 281.
 Fine Arts, '01, 289.
 Finland, '98, 312; '99, 316; '00, 339; '01, 289.
 Fire Boats, '98, 313.
 Fireproofing, '98, 313; '99, 317.
 Fire Protection, '98, 313; '99, 317; '00, 340; '01, 291.
 Fish and Fisheries, '99, 318; '00, 341; '01, 291.
 Fisheries, '98, 313.
 Fisher, George Purnell, '99, 320.
 Fisheries Society, American, '98, 316; '99, 320; '00, 342.
 Fiske, John, '01, 293.
 Fitzgerald, George Francis, F.R.S., '01, 293.
 Flag Association, American, '98, 315.
 Flag, Jared Bradley, '99, 320.
 Flag House Association, American, '98, 315.
 Flagler, Daniel W., '99, 320.
 Flax, '99, 320; '00, 342; '01, 294.
 Fletcher, Banister, '99, 321.
 Fletcher, Thomas Clement, '99, 321.
 Flint, '01, 294.
 Florence, '98, 315.
 Florida, '98, 315; '99, 320; '00, 343; '01, 294.
 Flower, Roswell Pettibone, '99, 325.
 Flower, William Henry, '99, 323.
 Fluorspar, '98, 317; '99, 324; '00, 345; '01, 295.
 Flying Machines, '99, 324; '00, 345; '01, 295.
 Folklore Society, American, '98, 317.
 Follett, David Lyman, '99, 324.
 Fontane, Theodor, '98, 317.

- Food, '99, 324; '00, 345; '01, 295.
 Football, '98, 317; '99, 325; '00, 347; '01, 295.
 Forbes, Archibald, '00, 348.
 Force, Manning Ferguson, '99, 326.
 Ford, Daniel Sharp, '99, 326.
 Ford, Edward Onslow, '01, 296.
 Ford, Francis Clare, '99, 326.
 Ford, Paul Leicester, '99, 327.
 Foreign Missions, American Board of Commissioners for, '99, 327; '00, 349; '01, 296.
 Foresters, Ancient Order of, '98, 317.
 Foresters, Independent Order of, '98, 317.
 Foresters of America, '98, 317.
 Forestier-Walker, Frederick William Edward, '99, 327.
 Forestry in the United States, '99, 327; '00, 349; '01, 296.
 Formaldehyde, '98, 317; '99, 330; '00, 354; '01, 300.
 Formalin, '98, 318.
 Formosa, '98, 319; '99, 330; '00, 354; '01, 300.
 Forshell, Hans Ludwig, '01, 300.
 Forum Romanum, '98, 319.
 Fortnum, Charles Drury Edward, '99, 330.
 Forzinnetti, Major, '98, 319.
 Fossil Botany, '98, 319; '99, 330; '00, 355; '01, 300.
 Foster, Addison G., '99, 331.
 Foster, Birkett, '99, 331.
 Foster, John Wilson, '98, 319.
 Foster, L. L., '01, 300.
 Foster, Vere Henry Louis, '00, 355.
 Foundations, '98, 320.
 Fountains, Electric, '01, 300.
 Fouquier, Jacques Francois Henri, '01, 300.
 Fournier, Hugues Marie, '98, 320.
 Fowler, Sir John, '98, 320.
 Fox, John, Jr., '00, 355.
 Fox-Pitt-Rivers, Augustus Henry Lane, '00, 356.
 France, '98, 320; '99, 331; '00, 356; '01, 300.
 France, Progress of, during the 19th Century, '00, 1010.
 Frankland, Edward, '99, 345.
 Franz, Ferdinand, '00, 366.
 Fraser, Sir William Augustus, M.A., '98, 334.
 Fraternal Congress, National, '00, 366.
 Fraternal Organizations, '99, 346; '00, 366; '01, 311.
 Fraternities, College, '99, 347.
 Frederic, Harold, '98, 334.
 Frederic, Victoria Adelaide Mary Louise, '01, 311.
 Free Baptist Young People, United Society of, '99, 348; '00, 368; '01, 312.
 Free Church of Scotland, '98, 335.
 Freemasons, '98, 335; '99, 348; '00, 368; '01, 312.
 Free Sons of Israel, 335.
 Free Methodist Church, '99, 348; '00, 368; '01, 312.
 Fremantle, General Sir Arthur James Lyon, '01, 312.
 French Congo, '98, 335; '99, 348; '00, 368; '01, 312.
 French, Elizabeth J., '00, 368.
 French Guiana, '98, 336; '99, 349; '00, 368; '01, 313.
 French Guinea, '98, 336; '99, 349; '00, 368; '01, 313.
 French, John Denton Pinkstone, '00, 368.
 French Literature, '98, 336; '99, 349; '00, 369; '01, 313.
 French School at Athens, '98, 340.
 French Soudan, '98, 340; '99, 352; '00, 374; '01, 317.
 French West Africa, '00, 374; '01, 318.
 Frick, Henry Clay, '01, 318.
 Friendly Islands, '00, 375; '01, 318.
 Friends of the Florida Seminoles, '98, 340.
 Friends, Society of, '98, 340; '99, 353; '00, 375; '01, 319.
 Frost, Percival, '98, 341.
 Fruin, Robert, '99, 354.
 Fruitnight, John Henry, '00, 375.
 Frye, William Pierce, '98, '98, 341; '01, 319.
 Fuchou, '00, 375.
 Fuel Gas, '98, 341.
 Fukuzawa, Yukichi, '01, 319.
 Fuller, Melville Weston, '01, 320.
 Fuller's Earth, '98, 341; '99, 354; '00, 375; '01, 320.
 Fullerton, William, '00, 375.
 Fulton, Justin Dewey, '01, 320.
 Funfl, '98, 341.
 Funston, Fred., '99, 354; '01, 320.
 Furnace, '98, 341.
 Furnaces, Garbage, '99, 354.
 Furneaux, Henry, '00, 375.
 Gaboon, '99, 354; '00, 376.
 Gabrilowitsch, Ossip, '00, 376.
 Gage, Lyman J., '98, 341.
 Galeati, Sebastian, '01, 320.
 Gallifet, Gaston Alexandre Auguste, '99, 354.
 Galloway, Tenth Earl of, '01, 320.
 Galt, Sir Thomas, '01, 320.
 Galton, Douglas, '99, 355.
 Galveston Hurricane, '00, 376.
 Galvin, Owen A., '98, 342.
 Gambia, '98, 342; '99, 355; '00, 376; '01, 320.
 Garbage and Refuse Collection and Disposal, '98, 343; '99, 355.
 Garbage Disposal, '00, 376.
 Garcia y Iniguez, Genera' Calixto, '98, 342.
 Garland, Augustus Hill, '99, 356.
 Garnets, '01, 321.
 Garnier, J. L. C., '98, 345.
 Gary, James A., '98, 345.
 Gas, '98, 345.
 Gas Engines, '00, 377.
 Gas, Illuminating and Fuel, '98, 345; '99, 356; '00, 377; '01, 321.
 Gas, Natural, '01, 324.
 Gas, Sewer, '99, 356.
 Gases, General Properties of, '98, 345.
 Gasterine, '01, 324.
 Gastro-Enterological Association, American, '98, 345.
 Gatacre, William Forbes, '99, 356.
 Gaullieur, Henri, '98, 345.
 Gear, John Henry, '00, 379.
 Geddes, William Duguld, '00, 379.
 Geinitz, Hans Bruno, '00, 379.
 Geissler Tubes, '98, 345.
 Gems, '98, 345; '00, 379; '01, 324.
 Germinder, George, '99, 357.
 General Society of the War of 1812, '98, 346.
 Gentianose, '98, 346.
 Geoffrion, Christophe Alphonse, '99, 357.
 Geographical Discoveries, Progress of, During the 19th Century, '00, 1016.
 Geographical Distribution, '99, 357; '00, 379.
 Geographical Progress, '00, 379; '01, 325.
 Geographical Society, American, '98, 346; '99, 359; '00, 379.
 Geographic Names, U. S. Board on, '01, 325.
 Geographic Society, National, '98, 346; '01, 325.
 Geological Society of America, '98, 346; '99, 357; '00, 379.
 Geological Surveys, '98, 346; '99, 357; '00, 380; '01, 325.
 Geology, '98, 346; '99, 358; '00, 380; '01, 326.
 Geology, Progress of, During the 19th Century, '00, 969.
 George Alexandrovitch, '99, 359.
 George, Prince, of Greece, '98, 346.
 Georgetown University, '00, 381; '01, 328.
 Georgia, '98, 348; '99, 359; '00, 381; '01, 328.
 Gerard, James Watson, '00, 384.
 Gerlachstein, Hohenwart, '99.
 German Archaeological Institute, '98, 350.
 German Baptists, '00, 384; '01, 329.
 German East Africa, '00, 384; '01, 329.
 German Evangelical Synod of North America, '98, 350; '99, 361; '00, 384; '01, 329.
 German Literature, '98, 351; '99, 361; '00, 384; '01, 329.
 German Methodist Church, '00, 385; '01, 331.
 German Reformed Church, '01, 331.
 German Southwest Africa, '98, 352; '99, 363; '00, 386; '01, 331.
 Germany, '98, 353; '99, 364; '00, 386; '01, 331.
 Germany, Progress of, During the 19th Century, '00, 1011.
 Getty, General George Washington, '01, 340.
 Geysers, '98, 359.
 Ghirlandaio, Fresco, '98, 360.
 Gibb, Elias John Wilkinson, '01, 340.
 Gibbs, John Blair, M.D., '98, 360.
 Gibling, Paul, '00, 395.
 Gibraltar, '00, 395; '01, 340.
 Gibson, Charles Hopper, '00, 395.
 Gilbert, Jasper Willet, '98, 360.
 Gilbert, Sir John Thomas, LL.D., '98, 360.

- Gilbert, Sir Joseph Henry, '01, 340.
 Gilbert, Mahlon Norris, '00, 395.
 Glider, William Henry, '00, 395.
 Gill, David, '00, 395.
 Gille, Philippe Emile François, '01, 340.
 Gillespie, Elizabeth Duane, '01, 341.
 Gilman, Daniel Coit, '01, 341.
 Gingko, '98, 360.
 Girls' Friendly Society in America, '99, 371; '00, 396; '01, 341.
 Glacial Geology, '99, 372.
 Glaciers, '98, 360; '99, 372; '01, 341.
 Gladstone, William Ewart, '98, 360.
 Gladstone, Mrs. William Ewart, '00, 396.
 Glasgow International Exposition, '01, 341.
 Gleason, Patrick Jerome, '01, 342.
 Goebel, William, '99, 372; '00, 396.
 Goethals, Paul, '01, 342.
 Gold, '98, 363; '99, 372; '00, 396; '01, 342.
 Gold and Silver, Melting Points of, '98, 364.
 Gold Coast, '98, 364; '99, 373; '00, 398; '01, 343.
 Golden Chain, Order of, '98, 365.
 Golden Gate Park Museum, '99, 373.
 Goldschmidt, Julius, '98, 365.
 Golf, '98, 365; '99, 373; '00, 400; '01, 344.
 Gomez, Maximo, '98, 365.
 Goodenough, Lieut.-Gen. Sir William Howley, K.C.B., '98, 365.
 Good Fellows, Royal Society of, '98, 366.
 Good Templars, '98, 366; '99, 374; '00, 401.
 Gordon, Charles Alexander, '99, 374.
 Gordon, W. W., '98, 366.
 Gore, Albert Augustus, '01, 344.
 Gorky, Maxim, '01, 345.
 Gorman, Arthur Pue, '99, 374.
 Goss, Charles Frederick, '00, 401.
 Got, Francis Jules Edmund, '01, 345.
 Gough, George Hugh, '00, 401.
 Gourko, Count Joseph Vasilievich, '01, 345.
 Gowing, Richard, '99, 374.
 Grade Crossings, '99, 375.
 Grain Elevators, '99, 375.
 Gramme, Zenobe Theophile, '01, 345.
 Grand Army of the Republic, '98, 366; '99, 375; '00, 401.
 Grand United Order of Odd Fellows of America, '98, 366.
 Grange, National, '98, 366; '99, 375; '00, 401.
 Granite, '98, 366.
 Grant, Robert, '00, 401.
 Graphite, '98, 366; '99, 375; '00, 402; '01, 345.
 Gras, General Basile, '01, 346.
 Grassi, Giovanni Battista, '00, 402.
 Grating for Spectrum, '98, 366.
 Graves, Charles, '99, 376.
 Graving Dock, '99, 376.
 Gravitation — Gravity, '98, 366.
 Gray, Elisha, '01, 346.
 Gray, George, '98, 366.
 Gray, Landon Carter, '00, 402.
 Gray, William C., '01, 346.
 Great Britain, '98, 366; '99, 376; '00, 402; '01, 346.
 Great Britain, Progress of, during the 19th Century, '00, 1008.
 Great Telescope (Paris Exposition), '98, 377.
 Greece, '98, 377; '99, 386; '00, 422; '01, 360.
 Greek Archaeological Society, '98, 379.
 Greek Church, '98, 379; '99, 388; '00, 424; '01, 362.
 Greek Literature, Modern, '98, 379.
 Green, Edmund Fiske, '01, 362.
 Green, Joseph F., '98, 379.
 Green, William Henry, '00, 424.
 Greenaway, Kate, '01, 362.
 Greene, Conyngham, '99, 388.
 Greene, George Sears, '99, 388.
 Greenland, '98, 379; '99, 389; '00, 425; '01, 362.
 Greenough, James Bradstreet, '01, 363.
 Gregorvitch, Charles, '01, 363.
 Gregory, Sir Charles Hutton, K.C.M.G., '98, 379.
 Gregory, John Milton, LL.D., '98, 380.
 Gregory, William, '01, 363.
 Grekoff, Dimitr Panajotoff, '99, 389.
 Grenada, '99, 389; '00, 425; '01, 363.
 Grenadines, '99, 389; '00, 425.
 Grey, Rt. Hon. Sir George, '98, 380.
 Gridley, Charles Vernon, '98, 380.
 Grier, William Moffatt, '99, 389.
 Griffith, Arthur F., '99, 389.
 Griggs, John William, '98, 380; '01, 363.
 Grimaux, Edouard, '00, 425.
 Grimm, Herman, '01, 363.
 Grippe, '98, 380; '99, 390; '01, 363.
 Gronlund, Laurence, '99, 390.
 Gross, Rev. William Hickley, D.D., '98, 380.
 Grosvenor, William Mason, '00, 425.
 Grove, Sir George, '00, 425.
 Grumbkow, Victor von, '01, 363.
 Guadeloupe, '98, 381; '99, 390; '00, 426; '01, 363.
 Guam, '98, 381; '99, 391; '00, 426; '01, 363.
 Guatemala, '98, 381; '99, 391; '00, 427; '01, 364.
 Guérin, Eugène, '99, 393.
 Guillou, Charles F., '99, 393.
 Gutnea Worm, '00, 428; '01, 364.
 Guzman-Blanco, Antonio, '99, 393.
 Guzman, Horacio, '01, 364.
 Gymnasiums, Municipal, '98, 531; '99, 394; '00, 428.
 Gymnastics, '99, 394.
 Gymnosperms, '98, 383.
 Gynecological Society, American, '98, 383.
 Gypsum, '98, 383; '99, 394; '00, 428; '01, 365.
 Gypsy Moth and Gypsy Moth Commission, '98, 383; '99, 394; '00, 429.
 Gzowski, Colonel Sir Casimir Stanislaus, '98, 384.
 Habibullah, Ameer of Afghanistan, '01, 365.
 Hadley, Arthur Twining, '99, 394.
 Hadley, Henry K., '01, 365.
 Haeckel, Ernst, '00, 429.
 Hagan, James, '01, 365.
 Hagarty, John Hawkins, '00, 429.
 Hague Conference, '99, 395; '00, 429; '01, 365.
 Hallstorm Prevention, '00, 430; '01, 365.
 Haulti, '98, 384; '99, 399; '00, 430; '01, 365.
 Hale, Lucretia Peabody, '00, 431.
 Haliburton, Robert Grant, '01, 366.
 Halli Rifat, Pasha, '01, 366.
 Hall, Abraham Oakley, '98, 385.
 Hall, Asaph, '01, 366.
 Hall, Charles, '00, 431.
 Hall, James, LL.D., '98, 385.
 Hall, John, D.D., '98, 386.
 Hall of Fame, '00, 432.
 Hambourg, Mark, '99, 400.
 Hamilton College, '98, 386; '99, 400; '00, 432; '01, 366.
 Hamilton, Ian Standish Monteith, '00, 432.
 Hamilton, Walter, '99, 400.
 Hamlin, Cyrus, '00, 432.
 Hammond, William Alexander, '00, 432.
 Handel and Haydn Society, '98, 387; '99, 400; '00, 432.
 Handy, Moses Purnell, '98, 387.
 Hankow, '00, 433.
 Hanna, Marcus Alonzo, '00, 433.
 Harbor Improvements, '99, 400; '00, 433.
 Harcourt, William Vernon, '98, 387.
 Harden, William Dearing, '98, 387.
 Harden-Hickey, Baron, '98, 387.
 Hardy, Arthur Sherburne, '99, 400.
 Harkness, Harvey W., '01, 366.
 Harlan, James, '99, 401.
 Harmer, Alfred C., '00, 434.
 Harmsworth, Alfred Charles, '01, 366.
 Harnden, Henry, '00, 434.
 Harriman Expedition, '99, 401.
 Harris, Addison C., '99, 401.
 Harris, George, '99, 401.
 Harris, Henry C., '99, 401.
 Harris, Samuel, '99, 401.
 Harrison, Benjamin, '01, 366.
 Harrison, Carter Henry, '99, 402.
 Harrison, Henry Baldwin, '01, 369.
 Harrowby, Dudley Francis Stuart Ryder, '00, 434.
 Hart, Ernest, '98, 388.
 Hart, James MacDougall, '01, 369.
 Hart, Sir Robert, '00, 434.
 Hartig, Ernst, '00, 435.

- Hartman, Johann Peter Emilius, '00, 435.
 Harvard University, '98, 388; '99, 402; '00, 435; '01, 370.
 Harvey, Rev. Moses, '01, 370.
 Hashish, '98, 388.
 Haskell, Joseph, '98, 388.
 Haswell, William Henry, '00, 436.
 Hatch, John Porter, '01, 370.
 Hatzfeldt-Wildenburg, Count von, '01, 370.
 Hauer, Franz, Ritter von, '99, 402.
 Hauptmann, Gerhardt, '99, 403; '00, 436.
 Havelock - Allan, Henry Marshman, '98, 389.
 Hawaii, or Sandwich Islands, '98, 389; '99, 403; '00, 437; '01, 371.
 Hawels, Hugh Reginald, '01, 373.
 Hawels, Mrs. Mary Eliza, '98, 391.
 Hawes, Josiah Johnson, '01, 373.
 Hawkins, Anthony Hope, '98, 391.
 Hawkins, Frederick, '00, 439.
 Hawkins, Hamilton S., '98, 392.
 Hawkins, Henry, '99, 404.
 Hay, '98, 392; '99, 404; '00, 440; '01, 373.
 Hay, Adelbert Stone, '01, 374.
 Hay, John, '98, 393; '01, 374.
 Hayden, Charles H., '01, 375.
 Hayti, '98, 384; '99, 399; '00, 430; '01, 375.
 Hayward, Monroe Leland, '99, 405.
 Hazeltine, William Stanley, '00, 440.
 Hazen, Henry Allen, '00, 440.
 Hazen, Rev. Dr. Henry Allen, '00, 441.
 Health Resort Association, American, '98, 393.
 Healy, James Augustine, '00, 441.
 Heap, Charles Swinnerton, '00, 441.
 Heart, Wounds of the, '99, 405; '01, 375.
 Heat, '00, 441.
 Heating, '00, 441.
 Heatstroke, '98, 394.
 Hedin, Sven Anders, '01, 375.
 Heine Memorial Fountain, '98, 394.
 Helium, '98, 394.
 Hellmuth, Rt. Rev. Isaac, '01, 376.
 Hely-Hutchinson, Sir Walter Francis, '01, 376.
 Hematite, '98, 394; '99, 405.
 Henderson, David Bremner, '99, 405.
 Hendricks, George A., '99, 406.
 Henley, William Ernest, '98, 394; '01, 376.
 Hennessy, John, '00, 442.
 Henry, Lieutenant - Colonel, '98, 395.
 Henry, Guy V., '98, 395; '99, 406.
 Henry, William Wirt, '00, 442.
 Henschel, Lillian (Bailey), '01, 376.
 Heptasopha, '98, 395.
 Heredity, '98, 395; '99, 406; '00, 442.
 Hermite, Charles, '01, 376.
 Herrara, Tomaso, '99, 406.
 Hering, Carl, '00, 442.
 Herne, James A., '01, 377.
 Herschel, Farrer, '98, 395; '99, 407.
 Hervé, Aimé Marie Edouard, '99, 407.
 Hervey Islands, '00, 442.
 Herz, Cornelius, '98, 395.
 Herzegovina, '98, 395; '99, 407; '00, 442; '01, 377.
 Herzogenberg, Heinrich von, '00, 442.
 Hessell, Rudolph, '00, 442.
 Heth, Henry, '99, 407.
 Hetol, or Sodium Cinnamate, '00, 442.
 Heureaux, Ulyses, '99, 408.
 Hewlett, Maurice Henry, '98, 395; '00, 442.
 Hibernians of America, '98, 395.
 Hierakoupolis, '98, 395.
 High-temperature Thermometry, '00, 443.
 Hilborn, Samuel Greeley, '99, 408.
 Hildesheim Treasure, '98, 396.
 Hill, David Jayne, '98, 396.
 Hill, Horace, '00, 443.
 Hill, James J., '00, 443.
 Hill, Nathaniel Peter, '00, 443.
 Hillis, Newell Dwight, '99, 408.
 Hilton, Henry, '99, 408.
 Hincks, Thomas, '99, 408.
 Hinsdale, Burke Aaron, '00, 443.
 Hirsch, Adolph, '01, 377.
 Hirsch, Clarade de, '99, 409.
 Hirsch, Joseph, '01, 377.
 Histology of Plants, '98, 396.
 Historical Association, American, '98, 396; '99, 409; '00, 443; '01, 377.
 Hitchcock, Ethan Allen, '98, 396.
 Hitchcock, Luke, '98, 396.
 Hitchcock, William A., '98, 396.
 Hittell, John Sherzer, '01, 377.
 Hoang Nan, '99, 409.
 Hoar, Sherman, '98, 396.
 Hobart, Garret Augustus, '99, 409.
 Hobbes, John Oliver, '00, 443.
 Hoblitzell, Fetter Shryer, '00, 444.
 Hoboken Fire, '00, 444.
 Hobson, Edward Henry, '01, 378.
 Hobson, Richmond Pearson, '98, 396.
 Hockey, Ice, '99, 410; '00, 444; '01, 378.
 Hoffman, Walter J., '99, 410.
 Hoffman, Wickham, '00, 444.
 Hofmann, Josef, '01, 378.
 Hofmeyr, Jan H., '99, 410.
 Hog Cholera, '99, 410.
 Hoge, Moses Drury, '99, 410.
 Hogg, Jabez, '99, 410.
 Hohenlohe - Schillingsfürst, '00, 444; '01, 378.
 Holburn, John Goundry, '99, 410.
 Holland, '99, 410; '00, 444; '01, 378.
 Holland Dames of the New Netherlands, '98, 397.
 Holls, George Frederick William, '99, 410.
 Holman, Silas Whitcomb, '00, 444.
 Holmes, Edward L., '00, 445.
 Home Circle, '98, 397.
 Homoeopathic, Ophthalmological, and Otological Association, American, '98, 397.
 Honduras, '98, 397; '99, 411; '00, 445; '01, 378.
 Hong Kong, '98, 398; '99, 411; '00, 446; '01, 379.
 Hood, Arthur William Acland, '01, 379.
 Hope, Anthony, '98, 398.
 Hopetoun, Earl of, John Adrian Louis Hope, '00, 447; '01, 379.
 Hopkins, Abel Grosvenor, '99, 412.
 Hopkins, Edward John, '01, 380.
 Hope, '01, 380.
 Hornby, Windham, '99, 412.
 Horticulture, '00, 447; '01, 380.
 Hoshi Toru, '01, 382.
 Hoskins, Sir Anthony Miley, '01, 382.
 Hospital, Roman, '98, 398.
 Hospital Abuse, '99, 412.
 Hospitals, '01, 383.
 Hot-air Treatment, '00, 449; '01, 383.
 Hotchkiss, Jed, '99, 412.
 Hours of Labor, '00, 450.
 Hovey, Richard, '00, 450.
 Howard, Blanche Willis, '98, 398.
 Howard, Guy, '99, 412.
 Howell, Charles P., '99, 412.
 Howell, George R., '99, 412.
 Hoyt, Charles Hale, '00, 450.
 Hoyt, John Quincy Adams, '00, 450.
 Hubbard, Oliver Payson, '00, 450.
 Hubbard, Richard B., '01, 383.
 Hübner, Ernest Willibald Emil, '01, 383.
 Hughes, David Edward, '00, 450.
 Hughes, Robert William, '01, 384.
 Huguenot Society of America, '98, 398; '99, 413; '00, 451.
 Huidekoper, Rush Shippen, M.D., '01, 384.
 Humane Association, American, '98, 398.
 Humane Education Society, American, '99, 413; '00, 451.
 Humbert L., '00, 451.
 Hungarian Literature, '98, 398; '99, 413; '00, 452; '01, 384.
 Hungary, '98, 399; '99, 413; '00, 453; '01, 385.
 Hunt, William Henry, '01, 385.
 Hunter, William Alexander, '98, 401.
 Hunter, Sir William Wilson, '00, 453.
 Huntington, Collis Potter, '00, 453.
 Hurley, Dennis M., '99, 415.
 Hutchinson, Benjamin P., '99, 415.
 Hutton, William Rich, '01, 385.
 Huxley Memorial, '00, 454.
 Hybridization, '99, 415; '00, 454.
 Hyde, Henry Baldwin, '99, 415.
 Hyde, Thomas W., '99, 415.
 Hydragogin, '00, 454.
 Hydraulic Cements, '99, 415; '00, 454.
 Hydrogen, '98, 401.

- Hydrogen, Liquefaction of, '98, 401.
 Hydrogen, Solidification of, '00, 454.
 Hydrophobia, '00, 455; '01, 385.
 Hygiene, '99, 418; '01, 385.
 Hygiene, School, '98, 401; '00, 455.
 Hylton, Baron, Hepworth Hyton Jolliffe, '99, 420.
 Hypnotism, '98, 401; '99, 420.
 Ice, '98, 404.
 Ice - Breaking Steamships, '99, 58; '00, 455.
 Ice-Boating, '99, 421; '00, 455.
 Ice-Hockey, '99, 421; '00, 455; '01, 386.
 Iceland, '98, 404; '99, 421; '00, 455; '01, 386.
 Ice Trust, '00, 456.
 Ice-Yachting, '99, 421; '00, 456; '01, 387.
 Ichthyology, '99, 422; '00, 456.
 Idaho, '98, 404; '99, 422; '00, 456; '01, 387.
 Illinois, '98, 405; '99, 424; '00, 456; '01, 388.
 Illinois, University of, '98, 407; '99, 426; '00, 482; '01, 390.
 Iloilo, '98, 407.
 Imbert De St. Amand, Baron Arthur Léon, '00, 463.
 Imeretinsky, Alexander, '00, 463.
 Immigration, '98, 407; '99, 427; '00, 463; '01, 391.
 Immunity, '98, 408; '99, 428; '00, 464; '01, 392.
 Imperial Academy of Science of St. Petersburg, '98, 408; '99, 428; '00, 464.
 Imperial Free Economic Association, '00, 464.
 Imports and Exports, '98, 408; '99, 428; '00, 464.
 Inch, Philipp, '98, 410.
 Inchinquin, Baron, Edward Donough O'Brien, '00, 464.
 Independent Order of Good Templars, '98, 410; '99, 428; '00, 465.
 Independent Order of Odd Fellows, '98, 410; '99, 428; '00, 465.
 Independents or Congregationalists, '98, 411.
 India, British, '98, 411; '99, 428; '00, 465; '01, 392.
 India, French, '01, 394.
 Indian Congress at Omaha, '98, 419.
 Indiana, '98, 421; '99, 431; '00, 469; '01, 394.
 Indiana University, '99, 433; '00, 471; '01, 397.
 Indians of the United States, '98, 422; '99, 433; '00, 472; '01, 398.
 Indians of the United States, Official Reports on, '98, 426; '99, 437.
 Indian Territory, '98, 420; '99, 440; '00, 475; '01, 402.
 Indo-China, '98, 428; '99, 441; '00, 477; '01, 403.
 Industrial Chemistry, '00, 478.
 Industrial Commission, '00, 478; '01, 403.
 Indy, Vincent D., '98, 429.
 Influenza, Epidemic, '99, 442; '01, 405.
 Infusorial Pigments, '98, 429.
 Ingalls, John James, '00, 480.
 Ingersoll, Robert Green, '99, 442.
 Ingram, Arthur Foley Win-
 nington, '01, 405.
 Inhibition, '99, 443.
 Inman, Henry, '99, 443.
 Inorganic Chemistry, '00, 480.
 Insanity, '99, 443; '00, 480; '01, 405.
 Insects and the Propagation of Diseases, '99, 443; '00, 481; '01, 406.
 Institute of Architects, American, '98, 429.
 Institute of Electrical Engineers, American, '98, 429; '99, 444; '00, 481.
 Institute of France, '98, 425; '99, 444; '00, 481; '01, 406.
 Institute of Homeopathy, American, '98, 429.
 Institute of Mining Engineers, American, '98, 429.
 Interference, '98, 429.
 Intermittent Filtration, '98, 429.
 International Brotherhood League, '98, 429; '99, 444.
 International Conference on the Preservation of Big Game, '00, 14 and 482.
 International Congresses, '00, 482.
 International Congress of Electricians, '00, 482.
 International Congress of Physicists, '00, 482.
 International Congress of Zoologists, '98, 429.
 International Date-Line, '98, 429; '99, 444.
 International Fisheries Conference, '99, 445; '00, 482.
 International League of Press Clubs, '98, 431.
 International Psychical Institute, '00, 482.
 International Sea Fisheries Congress, '98, 431.
 International Society of Sculpture, etc., '98, 431.
 International Sports, '99, 446; '00, 482.
 International Yacht Races, '99, 446; '00, 482; '01, 865.
 Inverclyde, First Baron, '01, 407.
 Iowa, '99, 431; '99, 446; '00, 482; '01, 407.
 Iowa, University of, '99, 447; '00, 485; '01, 409.
 Ireland, '98, 432; '99, 447; '00, 485; '01, 409.
 Ireland, Church of, '00, 485; '01, 409.
 Irish Catholic Benevolent Union, '98, 434.
 Irish Historical Society, American, '98, 434.
 Irish National Federation of America, '98, 434.
 Iron and Steel, '98, 434; '99, 448; '00, 486; '01, 409.
 Iron Clay, '98, 439; '99, 451.
 Iron Hall, '98, 439.
 Irrigation, '98, 439; '99, 451; '00, 490; '01, 412.
 Irwin, John, '01, 414.
 Irwin, John Nichol, '99, 452.
 Isis League of Music and Drama, '98, 440.
 Isthmian Canal Commission, '00, 491; '01, 414.
 Ismay, Thomas Henry, '99, 452.
 Italian Literature, '98, 440; '99, 452; '00, 491; '01, 414.
 Italy, '98, 441; '99, 454; '00, 494; '01, 417.
 Italy, Progress of, During the 19th Century, '00, 1014.
 Ito, Hirobumi, '00, 499.
 Ives, William Bullock, '99, 457.
 Ivory Coast, '00, 499; '01, 421.
 Iwaski, Baron Yataro, '01, 422.
 Jackson, Henry Melville, '00, 500.
 Jackson, Henry Rootes, '98, 448.
 Jackson, Leonora, '00, 500.
 Jacobini, Domenico Maria, '00, 500.
 Jacobowski, Ludwig, '00, 500.
 Jamaica, '98, 446; '99, 457; '00, 500; '01, 422.
 James, Charles P., '99, 458.
 Japan, '98, 447; '99, 459; '00, 501; '01, 423.
 Jasper, John, '01, 426.
 Java, '98, 450; '99, 463; '00, 507; '01, 426.
 Jeanne d'Arc, Statue of, '98, 451.
 Jefferson, Cornelia, '99, 464.
 Jenner, Sir William, '98, 451.
 Jewett, Sara, '99, 464.
 Jewish Women, Council of, '99, 465; '00, 508.
 Jews, '98, 451; '99, 465; '00, 508; '01, 427.
 Joachim, Amalie Schnee-
 weiss, '99, 465.
 Joachim, Joseph, '99, 466.
 Johns Hopkins University, '98, 452; '99, 466; '00, 510; '01, 429.
 Johnson, Albert L., '01, 429.
 Johnson, Tom Loftin, '01, 429.
 Johnston, Sir Harry Ham-
 lilton, '01, 430.
 Johnston, Mary, '00, 511.
 Johnston, Richard Malcolm, '98, 453.
 Johnston, William Preston, '99, 466.
 Johore, '01, 430.
 Joinville, Prince de, François Ferdinand Philippe Louis Marie d'Orleans, '00, 511.
 Jokai, Maurus, '98, 453; '00, 511.
 Jones, Alfred, '00, 512.
 Jones, Henry, '99, 466.
 Jones, Hiram A., '98, 453.
 Jones, John Viriamu, '01, 430.
 Jones, Samuel M., '99, 466.
 Joubert, Petrus Jacobus, '99, 467; '00, 512.
 Judd, Albert Francis, '00, 513.
 Jullan, George Washington, '99, 467.
 Julius Cæsar, '98, 453.
 June, Jennie, '01, 430.
 Jupiter's Atmosphere, '98, 453.
 Jurassic, '98, 453.
 Kalulani, '99, 467.
 Kalagua, '99, 467.
 Kalnoky de Koros-Patak, Gustav Siegmund, '98, 453.
 Kamerun, '00, 513; '01, 430.
 Kansas, '98, 453; '99, 467; '00, 513; '01, 430.
 Kansas, University of, '00, 515; '01, 433.
 Kaolin, '98, 455; '99, 470.
 Kasson, John Adams, '98, 454.
 Katsura, General Viscount Taro, '01, 433.
 Kautz, Albert, '99, 470.
 Kean, John, '99, 470.

- Keeler, James Edward, '00, 515.
 Keeley, Leslie E., '00, 515.
 Keeley, Mrs. Robert, '99, 470.
 Keely, John Ernest Worrell, '98, 455.
 Keene, Thomas W., '98, 455.
 Kellogg, Elijah, '01, 434.
 Kellogg, Samuel, '99, 470.
 Kelly-Kenny, Thomas, '00, 515.
 Kemp, Dixon, '99, 470.
 Kempff, Louis, '00, 515.
 Kendall, Ezra Otis, '99, 471.
 Kennedy, George N., '01, 434.
 Kennedy, John, '00, 515.
 Kent, Jacob F., '98, 455.
 Kentucky, '98, 455; '99, 471; '00, 515; '01, 434.
 Kerr, Mark Ralph George, '00, 519.
 Kerr, Norman Shanks, '99, 473.
 Kerr, Orpheus C., '01, 435.
 Ketteler, Clemens August, '00, 520.
 Key, David McKendree, '00, 520.
 Khiva, '00, 520; '01, 435.
 Kiau-Chau, '99, 473; '00, 520.
 Kiefert, Heinrich, '99, 473.
 Kimball, Alonzo S., '98, 457.
 Kinetic Theory of Gases, '98, 457.
 King, Clarence, '01, 435.
 King, John M., '99, 473.
 King, William S., '00, 520.
 King's Daughters and Sons, '98, 457; '99, 473; '00, 520; '01, 435.
 Kingsford, William, '98, 457.
 Kingsley, Miss Mary H., '00, 520.
 Kipling, Rudyard, '98, 457; '99, 473; '00, 520; '01, 435.
 Kirkland, William A., '98, 457.
 Kirkpatrick, George A., '99, 473.
 Kitchener, Horatio Herbert, '98, 457; '00, 521; '01, 435.
 Kite Flying, '00, 521.
 Klukiang, '00, 521.
 Knighton, William, '00, 521.
 Knights and Ladies of Honor, '98, 455.
 Knights of Golden Eagle, '98, 455.
 Knights of Honor, '98, 455.
 Knights of Labor, '98, 455; '99, 473; '00, 521; '01, 435.
 Knights of Malta, '98, 455.
 Knights of St. John and Malta, '98, 455.
 Knights Templars, '98, 455; '99, 474; '00, 521.
 Knill, Sir Stuart, '98, 455.
 Knipe, Joseph Farmer, '01, 435.
 Knorr, Angelo, '99, 474.
 Knox, Charles Eugene, '00, 521.
 Knox, Philander Chase, '01, 435.
 Koch, Robert, '01, 435.
 Koenig, Rudolph, '01, 435.
 Koerber, Ernst von, '00, 521.
 Kontski, Antoine de, '00, 521.
 Koweyt, '01, 437.
 Kraus, Adolph F., '01, 437.
 Kremenitz, Philipp, '99, 474.
 Kropotkin, Peter Alexeyevich, '00, 522.
 Kruger, Stephen John Paul, '99, 474; '00, 522; '01, 437.
 Krypton, '98, 455.
 Kubelik, Johann, '01, 437.
 Kumassi, '00, 523.
 Kung, Prince, '98, 455.
 Kuyper, Abraham, '01, 437.
 Kwang Hsu, '00, 523.
 Kyle, James Henderson, '01, 437.
 Labor, '98, 455; '99, 474; '00, 523; '01, 435.
 Labor, American Federation of, '01, 440.
 Labor Legislation, '00, 523.
 Labori, Fernand, '98, 461; '99, 476.
 Labuan, '98, 461; '99, 477; '00, 529.
 Lacaze-Duthiers, Felix Joseph Henry, '01, 440.
 Lacrosse, '99, 477; '00, 529; '01, 440.
 Ladies' Catholic Benevolent Association, '98, 461.
 Ladies' Union Relief Association, '98, 461.
 Ladrones, or Marianne Islands, '98, 462; '99, 477; '00, 530; '01, 440.
 Lafèche, Rt. Rev. Louis François, '98, 462.
 Laffin, Byron, '01, 440.
 Lagos, '98, 462; '00, 530; '01, 440.
 Lake Regulations, '99, 478.
 Lamarckism, '99, 478; '00, 530.
 Lamoureux, Charles, '99, 478.
 Lampman, Archibald, '99, 478.
 Lamsdorff, Count, '00, 530.
 Lamson, Charles Marlon, '99, 478.
 Landscape Gardening, '00, 530.
 Lands, Public, '98, 462; '99, 478; '00, 530; '01, 441.
 Laos, '00, 535; '01, 442.
 Largin, '00, 535.
 Laasserre, Henri de Monzie, '00, 535.
 Lathom, First Earl of, Edward Bootle-Wilbraham, '98, 466.
 Lathrop, George Parsons, '98, 466.
 Latter-day Saints, '98, 466; '99, 482; '00, 536; '01, 442.
 Laurier, Rt. Hon. Sir Wilfred, '98, 466.
 Lava, '98, 466.
 Lavroff, Pyotr Lavrovich, '00, 536.
 Larves, John, '00, 536.
 Lawn-tennis, '98, 772; '99, 768; '00, 536; '01, 442.
 Lawrence, William, '99, 482.
 Lawson, John, '01, 442.
 Lawton, Henry W., '98, 466; '99, 483.
 Lead, '99, 484; '00, 537; '01, 443.
 Lead Poisoning, '99, 484.
 League of American Municipalities, '98, 467; '99, 484.
 League of American Wheelmen, '98, 467; '99, 484; '00, 538.
 Leary, Richard P., '01, 443.
 Leathes, Stanley, '00, 538.
 Lebrun-Renault, '98, 467.
 Lecithin, '01, 443.
 Lecithin in Plants, '98, 467.
 Le Conte, Joseph, '01, 443.
 Lee, Fitzhugh, '98, 467.
 Lee, Colonel Henry, '98, 467.
 Lee, Sidney, '98, 467.
 Leeward Islands, '98, 467; '99, 484; '00, 538; '01, 444.
 Le Gallienne, Richard, '98, 468.
 Legion of Honor, '98, 468; '99, 484; '00, 538.
 Legion of Honor, American, '98, 468.
 Lehmann, L.H.H., '98, 468.
 Lehmann, Liza, '98, 468.
 Leibl, Wilhelm, '00, 539.
 Leipzig, '98, 468.
 Leitner, Gottlieb William, '99, 485.
 Leland, Stanford, Jr., University, '00, 539; '01, 445.
 Leo XIII., Pope, '98, 468; '99, 485; '00, 539.
 Leonard, Moses Gage, '99, 485.
 Leopardi, Giacomo, '98, 469.
 Leopold II., '99, 485.
 Lepidodendron, '98, 469.
 Leprosy, '98, 469; '99, 485; '00, 539; '01, 445.
 Levi, Hermann, '00, 540.
 Lévy, Paul Calmann, '00, 540.
 Lewelling, Lorenzo D., '00, 540.
 Lewis, Most Rev. John Travers, '01, 446.
 Lewis, Samuel T., '01, 446.
 Leyds, William Johannes, '99, 486; '00, 541.
 Liberia, '98, 470; '99, 486; '00, 541; '01, 446.
 Libraries, Gifts to, '01, 447.
 Libraries, Progress of, During the 19th Century, '00, 984.
 Library Association, American, '98, 471; '99, 487; '00, 542; '01, 448.
 Liddell, Very Rev. Henry George, '98, 471.
 Liebknecht, Wilhelm, '00, 542.
 Liezen-Mayer, Alexandre von, '98, 471.
 Life-saving Service, '98, 471; '99, 487; '00, 542; '01, 448.
 Lift Locks, '98, 471.
 Li Hung Chang, '99, 488; '00, 542; '01, 448.
 Limes, '98, 471.
 Limestone, '98, 471.
 Limonite, '98, 471.
 Lindsay, Robert James, '01, 449.
 Lindsey, Montagu Peregrine Bertie, '99, 488.
 Lintner, Joseph Albert, '98, 471.
 Linton, Elizabeth Lynn (Mrs.), '98, 472.
 Linton, William James, '98, 472.
 Lipton, Thomas Johnstone, '99, 488; '01, 449.
 Liquefaction of Gases, '98, 472.
 Liquid Air and Bacteria, '00, 543.
 Liquid Air and Oxygen, '98, 472.
 Liquid Air in Medicine, '99, 488.
 Liquors, Wines, and Beer, '98, 477.
 Lisbourne, Ernest George Henry Arthur Vaughan, '99, 488.
 Literature, American and English, '98, 478; '99, 488; '00, 543; '01, 449.
 Lithium, '01, 455.
 Lithographic Limestone, '98, 485; '01, 459.
 Littlejohn, Rt. Rev. Abram Newkirk, '01, 459.
 Liver, '01, 459.
 Liver Dextrin, '98, 485.
 Liver Pigments, '98, 485.
 Liverpool, '98, 485.
 Live Stock, '01, 459.
 Lloyd, Daniel Lewis, '99, 500.

- Lloyd, John Uri, '01, 459.
 Lobster Industry, '00, 549.
 Loch, Henry Brougham, '00, 549.
 Lockhart, William Ewart, '00, 549.
 Lockwood, Sir Francis, '98, 485.
 Locomotive, '98, 485; '99, 500; '00, 549.
 Locust Plague, '00, 549.
 Lodging Houses, Municipal, '00, 549; '01, 459.
 Loeb, Jacques, '00, 549; '01, 459.
 Loess, '99, 500.
 Logan, John A., '99, 500.
 Lommel, Eugen von, '99, 501.
 Londesborough, William Henry Forester Denison, '00, 550.
 London, '98, 485; '00, 550.
 London, Jack, '00, 550.
 Long-distance and Submarine Telephony, '00, 550.
 Long, John Davis, '98, 486.
 Lord, William Paine, '99, 501.
 Lothian, Henry Kerr, '00, 550.
 Loubet, Emile, '99, 501.
 Louis, Charles, '00, 550.
 Louise, Princess of Prussia, '01, 459.
 Louise Wilhelmina Frederika Caroline Augusta Julia, Queen of Denmark, '98, 486.
 Louisiana, '98, 486; '99, 502; '00, 550; '01, 459.
 Louisiana Purchase Exposition, '01, 460.
 Lounsbury, George E., '98, 488.
 Louvre, Additions to, '98, 488.
 Low, Seth, '99, 503; '01, 461.
 Lowe, Edward Joseph, '00, 554.
 Lowry, Robert, '99, 503.
 Loyal Legion, Military Order of the, '99, 504; '00, 554.
 Luby, Thomas Clarke, '01, 462.
 Ludlam, Reuben, '99, 504.
 Ludlow, General Benjamin C., '98, 488.
 Ludlow, George Craig, '00, 554.
 Ludlow, Henry Charles Lopes, '99, 504.
 Ludlow, William, '98, 489; '01, 462.
 Lugard, Rt. Hon. Sir Edward, '98, 489.
 Lugger, Orro, '01, 462.
 Lunar Photography, '98, 489.
 Lupus, '99, 504; '01, 462.
 Luquens, Jules, '99, 504.
 Luther, Carl Theodor Robert, '00, 554.
 Lutheran Church in the United States, '98, 489; '99, 504; '00, 554; '01, 462.
 Luther League, '98, 489; '99, 504; '00, 554; '01, 463.
 Luxemburg, '98, 489; '99, 504; '00, 555; '01, 463.
 Lyddite, '99, 505.
 McAdam, David, '01, 464.
 MacArthur, Arthur, '00, 555.
 Maccabees, Order of, '98, 489.
 McCalla, Bowman H., '00, 555.
 McCarthy, Dalton, '98, 489.
 McCarthy, Richard Doyle, '01, 464.
 McClelland, John Alexander, '00, 555.
 McClurg, General Alexander Caldwell, '01, 464.
 McColgan, Mgr. Edward, '98, 490.
 MacColl, Evan, '98, 490.
 McComas, Louis Emory, '99, 505.
 McConnell, James, '99, 505.
 McCormick, Leander J., '00, 556.
 McCormac, William, '99, 505; '01, 464.
 McCoy, Frederick, '99, 506.
 McCumber, Porter J., '99, 506.
 Macdonald, Angus, '00, 556.
 Macdonald, Claude Maxwell, '00, 556.
 Macdonald, Hector Archibald, '99, 506.
 Macdowell, Edward Alexander, '99, 506.
 Macedonia, '98, 490; '99, 506.
 Macedonian Committee, '00, 556; '01, 464.
 McEnroe, William Hale, '99, 506.
 Macfarlan, David, '99, 506.
 McGiffert, Arthur C., '99, 506; '00, 556.
 McGlynn, Edward, '00, 556.
 McGovern, Rt. Rev. Thomas, '98, 490.
 McGuire, Hunter Holmes, '00, 557.
 Mackay, Eric, '98, 490.
 McKenna, Joseph, '98, 490.
 Mackenzie, John, '99, 507.
 McKinley, William, '98, 490; '00, 557; '01, 464.
 MacLagan, Douglas, '00, 560.
 McLane, Robert Milligan, '98, 492.
 McLeay, Franklin, '00, 560.
 McLellan, Isaac, '99, 507.
 McMahon, Mgr. James, '01, 469.
 McManes, James, '99, 507.
 McMurtrie, William, '00, 560.
 McNair, Frederick Vallette, '00, 560.
 Macrae, Douglas Gordon, '01, 469.
 Madagascar, '98, 493; '99, 507; '00, 561; '01, 469.
 Madela, '01, 470.
 Madrazo, Federico de, '98, 493.
 Maeder, Mrs. Clara Fisher, '98, 493.
 Maeterlinck, Maurice, '01, 470.
 Magee, Christopher Lyman, '01, 470.
 Magnallum, '00, 562.
 Magnesite, '98, 494; '99, 508; '00, 562; '01, 470.
 Magnetic Survey, '00, 562.
 Mahan, Alfred Thayer, '99, 508.
 Mail Tubes, '98, 494.
 Maine, '98, 494; '99, 509; '00, 563; '01, 470.
 Maine, The (Battleship), '98, 495.
 Major, Charles, '00, 565.
 Malaria, '98, 495; '99, 510; '00, 565; '01, 472.
 Malay States, Federated, '01, 473.
 Malletta Laupapa, '98, 495.
 Mallarme, Stephane, '98, 495.
 Malleson, Colonel George Bruce, '98, 495.
 Mallon, Mrs. Isabel Allerdice, '98, 495.
 Malmesbury, Edward James Harris, '99, 511.
 Malone, Sylvester, '99, 512.
 Malta, '98, 495; '99, 512; '00, 565; '01, 473.
 Malta Fever, '01, 473.
 Mammalogy, '99, 513; '00, 565; '01, 474.
 Manchuria, '01, 475.
 Manganese, '98, 496; '99, 513; '00, 565; '01, 476.
 Manitoba, '98, 496; '99, 513; '00, 566; '01, 476.
 Mansfield, Fourth Earl of, William Daniel Murray, '98, 496.
 Manuel, Eugene, '07, 476.
 Manufactures, '98, 496; '99, 514; '00, 567; '01, 477.
 Manuscript Society of New York, '98, 499; '00, 569.
 Manvers, Sydney William Herbert Pierrepont, '00, 569.
 Mapleson, James Henry, '01, 479.
 Marble, '98, 499; '99, 515; '00, 569.
 Marcel-Habert, Henry Ernest, '99, 515.
 Marcet, William, '00, 569.
 Marchand, Felix Gabriel, '00, 569.
 Marchand, Jean, '99, 516.
 Marchand, Major, '98, 499.
 Marchesi, Blanche, '98, 499.
 Marconi, William, '99, 516; '01, 479.
 Marcou, Jules, '98, 499.
 Marcy, Oliver, '99, 516.
 Margall, Francisco P., '01, 480.
 Margueritte, Paul and Victor, '98, 499.
 Marindin, Francis Arthur, '00, 569.
 Marine Biological Association, '98, 499; '99, 517; '00, 569.
 Marine Engineering, '99, 517.
 Markham, Edwin, '99, 517.
 Marks, Henry Stacy, '98, 499.
 Marriage, Medical Control of, '99, 518; '00, 569; '01, 480.
 Marryat, Florence, '99, 518.
 Mars, '98, 500.
 Mars, Atmosphere, '98, 500.
 Marsh, Othniel Charles, '99, 518.
 Marshall, Mrs. Emma, '99, 519.
 Marshall, George A., '99, 519.
 Martin, William Alexander Parsons, '00, 570.
 Martinique, '98, 500; '99, 519; '00, 570; '01, 480.
 Martineau, James, '00, 571.
 Martucci, Giuseppe, '99, 520.
 Maryland, '98, 500; '99, 520; '00, 572; '01, 480.
 Mascagni, Pietro C., '98, 501.
 Mashonaland, '00, 575; '01, 483.
 Mason, Edwin C., '98, 501.
 Mason, Theodorius, '99, 521.
 Mason, Thomas Henry, '00, 575.
 Massachusetts, '98, 502; '99, 521; '00, 575; '01, 483.
 Massie, Admiral Thomas Leake, '98, 505.
 Matabeland, '00, 575; '01, 485.
 Mathematical Society, American, '98, 505; '99, 524; '00, 579.
 Mather, Frederick, '00, 579.
 Mather, Margaret, '98, 505.
 Mathews, Albert P., '01, 485.
 Mathews, General Sir Lloyd William, '01, 485.
 Matter, '98, 505.
 Matthews, Claude, '98, 505.

- Maurel, Victor, '98, 506.
 Mauritius, '98, 506; '99, 524; '00, 579; '01, 486.
 Maury, Dabney Herndon, '00, 580.
 Maxwell, Sir William Edward, '98, 506.
 May, Phil, '98, 506.
 Mayflower Descendants, Society of, '99, 524; '00, 580.
 Mayo, William Kennon, '00, 581.
 Mayo-Smith, Richmond, '01, 486.
 Mazet, Robert, '99, 525.
 Meade, Hon. Sir Robert Henry, '98, 506.
 Measles, '98, 506; '01, 496.
 Meat Inspection, '00, 581.
 Mechanical Engineers, American, Society of, '99, 525; '00, 581.
 Mechanical Filtration, '98, 506.
 Mecklenburg - Schwerin, Duke of, '00, 581.
 Medal of Honor Legion, '98, 506; '99, 525; '00, 581.
 Medical Association, American, '98, 506; '99, 525; '00, 581.
 Medical Association, British, '99, 525.
 Medical Editors' Association, American, '98, 506.
 Medical Progress, '99, 525; '00, 581; '01, 486.
 Medical Temperance Association, American, '98, 506.
 Medicine, '98, 506.
 Medicine, American Academy of, '01, 487.
 Medicine, Progress of, During the 19th Century, '00, 971.
 Medico-Psychological Association, American, '98, 506; '99, 525; '00, 581.
 Medill, Joseph, '99, 526.
 Mehan, Thomas, '01, 487.
 Meerschaur, '01, 487.
 Meler, Hermann Heinrich, '98, 506.
 Melba, Nellie, '98, 506.
 Melde, Franz Emil, '01, 487.
 Meline, Felix Jules, '98, 506; '99, 526.
 Melos, '98, 506.
 Menand, Louis, '00, 581.
 Menelek II., '99, 526.
 Meningitis, '98, 506; '99, 526.
 Mennonites, '00, 582; '01, 487.
 Mental Science, '00, 582.
 Mercerized Cotton, '00, 582.
 Mercier, Auguste, '99, 526.
 Mercury, '99, 527; '00, 582; '01, 487.
 Mercury's Atmosphere, '98, 506.
 Meredith, Edmund Allen, '99, 527.
 Mergenthaler, Ottmar, '99, 527.
 Meridian Photography, '98, 506.
 Merriam, William Rush, '99, 527.
 Merrill, Samuel, '99, 527.
 Merriman, Henry Seaton, '98, 506.
 Merritt, Wesley, '98, 506.
 Mertel, Teodoro, '99, 527.
 Metabolic Fever, '00, 582.
 Metallic Minerals, Production of, '98, 507.
 Metallurgy, '00, 582.
 Metamorphic Rocks, '98, 507; '99, 527; '00, 582.
 Metargon, '98, 507.
 Meteorites, '99, 527; '00, 582; '01, 487.
 Meteorology, '98, 507; '99, 528; '00, 583; '01, 488.
 Meteorology, Ancient Documents on, '99, 528.
 Meteor Photography, '00, 584.
 Meteors, '98, 508; '99, 529; '01, 488.
 Meter, '98, 508.
 Methodist Church, Congregational, '01, 488.
 Methodist Church, Free, '98, 508; '99, 529; '00, 584; '01, 488.
 Methodist Ecumenical Conference, '01, 488.
 Methodist Episcopal Church, '98, 508; '99, 529; '00, 584; '01, 489.
 Methodist Episcopal Church, South, '98, 509; '99, 529; '00, 584; '01, 490.
 Methodist Protestant Church, '98, 509; '99, 529; '00, 584; '01, 490.
 Methodists, Primitive, '01, 490.
 Methuen, Baron Paul Sanford Methuen, '99, 529.
 Metropolitan Museum of Art, '98, 509; '99, 529; '00, 585; '01, 490.
 Mexborough, Earl of, John Charles George Savile, '99, 530.
 Mexico, '98, 509; '99, 530; '00, 585; '01, 491.
 Mexico, Synod of (Presbyterian), '01, 494.
 Miaskowski, August von, '99, 533.
 Mica, '98, 515; '99, 533; '00, 590; '01, 494.
 Michael Alexandrovitch, '99, 533.
 Michie, Archibald, '99, 533.
 Michie, Peter Smith, '01, 494.
 Michigan, '98, 515; '99, 533; '00, 590; '01, 494.
 Michigan, University of, '98, 516; '99, 536; '00, 592; '01, 497.
 Microbe Light, '00, 593.
 Microscopical Society, American, '99, 536; '00, 593; '01, 497.
 Middleton, Sir Frederick Dobson, '98, 517.
 Milan, ex-King, '01, 497.
 Milburn, John George, '01, 498.
 Miles, Nelson Appleton, '98, 517.
 Miles, William Porcher, '99, 536.
 Military Academy, United States, '00, 593; '01, 498.
 Military Order of Foreign Wars, '98, 517; '99, 536; '00, 594.
 Military Order of the Loyal Legion of the United States, '98, 518.
 Military Progress During the Century, '00, 972.
 Milk, '01, 499.
 Milk Supply, '98, 518; '99, 536; '00, 594.
 Millais, Lady, '98, 518.
 Millerand, Alexandre, '00, 594.
 Miller, Lewis, '99, 537.
 Miller, Marcus P., '98, 518.
 Millocker, Karl, '99, 537.
 Milne-Edwards, Alphonse, '00, 594.
 Milner, Alfred, '99, 537; '00, 595; '01, 499.
 Miner, Henry C., '00, 595.
 Mind Cure, '99, 537.
 Mineralogy, '98, 518; '99, 537; '00, 595; '01, 500.
 Mineral Paints, '98, 518; '99, 538; '00, 595; '01, 500.
 Mineral Production of the United States, '01, 500.
 Mineral Waters, '98, 518; '99, 538; '00, 595; '01, 502.
 Mining, '98, 518; '99, 538; '00, 595.
 Mining Engineering, '99, 541.
 Mining Engineers, American Institute of, '99, 541; '00, 597.
 Minnesota, '98, 519; '99, 542; '00, 597; '01, 502.
 Minnesota, University of, '98, 521; '99, 544; '00, 599; '01, 505.
 Minto, Fourth Earl of, Gilbert John Murray Kynynmond Elliot, '98, 521.
 Miquel, Johannes von, '01, 505.
 Missionary Association, American, '99, 544; '00, 600; '01, 506.
 Missions, Christian Foreign, '98, 521; '99, 544.
 Missions, Protestant, Foreign, '00, 600.
 Mississippi, '98, 522; '99, 544; '00, 602; '01, 506.
 Missouri, '98, 523; '99, 545; '00, 605; '01, 507.
 Missouri, University of the State of, '00, 608; '01, 510.
 Mitchell, Peter, '99, 548.
 Mitchell, S. Weir, '98, 524.
 Mivart, St. George, '00, 608.
 Mohammedanism, '98, 524.
 Monazite, '98, 524; '99, 548; '00, 609; '01, 511.
 Money, '98, 525; '99, 548; '00, 609.
 Monier-Williams, Sir Monier, '99, 548.
 Monkhouse, William Cosmo, '01, 511.
 Monroe, John, '99, 548.
 Monson, Sir Edmund John, '98, 526.
 Montana, '98, 526; '99, 548; '00, 609; '01, 511.
 Montenegro, '98, 527; '99, 551; '00, 614; '01, 512.
 Montgomery Conference, '00, 614.
 Montserrat, '99, 551; '00, 614; '01, 513.
 Moody, Dwight Lyman, '99, 552.
 Moon Photography, '98, 528.
 Moon's Atmosphere, '98, 528.
 Moore, Eliakim Hastings, '01, 513.
 Moore, George, '98, 528.
 Moore, John Bassett, '98, 528.
 Moore, Rt. Rev. John, '01, 513.
 Moran, Edward, '01, 513.
 Moravian Church, '98, 528; '99, 552; '00, 614; '01, 513.
 Moreau, Rt. Rev. Louis Zephirin, '01, 514.
 Morelli, Domenico, '01, 514.
 Morfit, Dr. Campbell, '98, 528.
 Morgan, John Pierpont, '00, 614; '01, 514.
 Mormons, or Latter-Day Saints, '98, 528; '99, 552; '00, 615; '01, 515.

- Mormonism, '99, 552.
 Morocco, '98, 529; '99, 554; '00, 618; '01, 515.
 Morphological Society, American, '98, 529; '01, 517.
 Morphology, '98, 529; '99, 555; '00, 616.
 Morrill, Justin Smith, '98, 529.
 Morris, Baron Michael Morris, '01, 517.
 Morrison, George Ernest, '00, 616.
 Morse, Elijah A., '98, 529.
 Mortality, '99, 555.
 Mosaics, '98, 529.
 Moszkowski, Moritz, '98, 529.
 Mosquitoes, '01, 517.
 Motor Vehicles, '98, 530; '99, 555.
 Mottl, Felix, '98, 530.
 Mouat, James, '99, 555.
 Moulton, Rev. William Fiddian, '98, 530.
 Mount, James Atwell, '01, 517.
 Mount Vernon Ladies' Association, '98, 530.
 Mowbray, John Robert, '99, 555.
 Mrak, Very Rev. Ignatius, '01, 517.
 Mucilage, '98, 530.
 Mucin Produced by Bacteria, '98, 530.
 Muhlenberg, Frederick Augustus, '01, 517.
 Mulhall, Michael G., '00, 617.
 Muller, George, '98, 530.
 Muller, Friedrich Max, '00, 617.
 Municipal Baths, '98, 531; '00, 618; '01, 517.
 Municipal Government, '99, 556; '00, 619; '01, 518.
 Municipal Gymnasium, '98, 531; '99, 558; '00, 622.
 Municipal Improvement, American Society for, '99, 558; '00, 622.
 Municipal League, National, '98, 531; '99, 558; '00, 622.
 Municipal Lodging-Houses, '00, 622; '01, 522.
 Municipal Ownership, '99, 558; '00, 622.
 Munkaczy, Mihaly, '00, 622.
 Munroe, Neil, '98, 531.
 Munster, George Herbert, '99, 558.
 Murat, Prince Joachim Napoleon, '01, 522.
 Muraviev, Michael Nikolayevich, '00, 623.
 Murphy, Mgr. Edward F., '01, 522.
 Murray, James Ormsby, '99, 559.
 Museum of Natural History, American, '98, 531; '99, 559; '00, 623.
 Music, '98, 531; '99, 559; '00, 623; '01, 522.
 Musical Art Society, '98, 531; '99, 563; '00, 630.
 Music Clubs, Federation of, '98, 539.
 Music During 19th Century, '00, 985.
 Musicians and Composers, Society of American, '99, 563.
 Musick, John Roy, '01, 528.
 Music Teachers' National Association, '98, 539.
 Mycenaen Civilization, '98, 539.
 Mystic Circle, '98, 539.
 Mystic Shrine, Nobles of the, '99, 563; '00, 630.
 Nairne, Charles Edward, '99, 563.
 Nanking, '00, 630.
 Napier and Ettrick, Baron Francis Napier, '98, 539.
 Napier and Ettrick, Francis Napier, '98, 539.
 Nash, George Kilbon, '99, 563.
 Natal, '98, 540; '99, 563; '00, 630; '01, 529.
 Nation, Mrs. Carrie, '01, 529.
 National Academy of Design, '98, 540.
 National Academy of Science, '98, 540; '99, 564.
 National Arts Club, '98, 540.
 National Association of Democratic Clubs, '98, 540.
 National Association of Naval Veterans, '98, 540.
 National Banks, '01, 530.
 National Dental Association, '98, 541.
 National Eclectic Medical Association, '98, 541.
 National Educational Association, '00, 631; '01, 532.
 National Export Exposition, '99, 564.
 National Farmers' Alliance and Industrial Union, '98, 541.
 National Gallery, '98, 541; '99, 564.
 National Gallery of British Art, '98, 541.
 National Geographic Society, '98, 541.
 National Grange, '98, 541.
 National League for Good Roads, '98, 542.
 National League of Mineral Painters, '98, 542.
 National Municipal League, '98, 542.
 National Museum, '98, 542; '99, 565; '00, 631.
 National Physical Laboratories, '00, 631.
 National Portrait Gallery, '98, 542.
 National Provident Union, '98, 542.
 National Republican League of the United States, '98, 542.
 National Sculpture Society, '98, 542.
 National Society of New England Women, '98, 542.
 National Society of the Spanish-American War, '98, 542.
 National Spiritualists' Association, '98, 542.
 National Union, Order of, '98, 542.
 National Women's Christian Temperance Union, '98, 542.
 Natural Gas, '98, 543; '99, 565; '00, 631; '01, 532.
 Natural Sciences, Academy of, '99, 565; '00, 632; '01, 532.
 Naval Academy, United States, '00, 632; '01, 532.
 Naval Architects and Marine Engineers, Society of, '99, 565; '00, 632.
 Naval Order of the United States, '98, 543; '99, 565; '00, 632.
 Naval Progress During 19th Century, '00, 975.
 Naval Veterans, National Association of, '99, 565.
 Navies, Foreign, '98, 543.
 Navigation, '98, 544.
 Naylor-Ledyard, Herbert Searisbrick, '99, 565.
 Nebraska, '98, 544; '99, 565; '00, 632; '01, 533.
 Nebraska, University of, '00, 634; '01, 534.
 Nebulae, '00, 635.
 Neely, Henry Adams, '99, 567.
 Negley, James S., '01, 535.
 Negro Problem, '98, 545; '00, 635; '01, 535.
 Nencki, Marcel, '01, 538.
 Neodermin, '01, 538.
 Neon, '98, 545.
 Nepal, '01, 538.
 Nerve Impulses, '01, 538.
 Netherlands, '98, 545; '99, 567; '00, 635; '01, 538.
 Neurological Association, American, '98, 547.
 Nevada, '98, 547; '99, 569; '00, 637; '01, 542.
 Nevin, Ethelbert, '01, 543.
 Newbolt, Henry John, '98, 548.
 New Brunswick, '98, 548; '99, 570; '00, 639; '01, 543.
 Newcomb, Mrs. Josephine Louise, '01, 544.
 Newell, Stanford, '99, 570.
 Newell, Robert Henry, '01, 544.
 Newell, William Augustus, '01, 544.
 New England Order of Protection, '98, 549.
 New England Society, '98, 549; '99, 571; '00, 639.
 Newfoundland, '98, 549; '99, 571; '00, 639; '01, 544.
 New Guinea, or Papua, '98, 550; '99, 573; '00, 540; '01, 545.
 New Hampshire, '98, 551; '99, 573; '00, 641; '01, 546.
 New Hebrides, '01, 547.
 New Jersey, '98, 552; '99, 575; '00, 642; '01, 548.
 New Jerusalem Church, '98, 554; '00, 646; '01, 549.
 Newman, John Philip, '99, 577.
 New Mexico, '98, 554; '99, 577; '00, 647; '01, 549.
 New-school and Old-school Presbyterians, '98, 555.
 New South Wales, '98, 555; '99, 579; '00, 648; '01, 552.
 Newth, Samuel, '98, 556.
 New York, '98, 556; '99, 580; '00, 649; '01, 553.
 New York Academy of Sciences, '98, 561; '99, 585; '00, 658; '01, 561.
 New York Botanical Garden, '98, 561.
 New York Chamber of Commerce, '98, 561; '99, 585; '00, 659.
 New York Public Library, '98, 561; '99, 589; '00, 659; '01, 561.
 New York University, '98, 561; '99, 586; '00, 659; '01, 561.
 New York Zoological Society, '98, 562; '99, 585.
 New Zealand, '98, 562; '99, 586; '00, 659; '01, 562.
 Nicaragua, '98, 563; '99, 586; '00, 661; '01, 563.

- Nicaragua Canal, '98, 564; '99, 58; '00, 662; '01, 564.
 Nicholas II., '98, 566.
 Nichols, Henry, '99, 591.
 Nicholson, Henry Alleyne, '99, 591.
 Nickel, '98, 566; '99, 591; '00, 666; '01, 567.
 Nickel Steel, '99, 591.
 Nicolay, John George, '01, 567.
 Nicolini, Ernesto, '98, 566.
 Nietzsche, Friedrich Wilhelm, '00, 666.
 Niger Coast Protectorate, '98, 566; '99, 591.
 Niger Territories, '98, 567; '99, 591.
 Nigeria, '00, 667; '01, 567.
 Ninde, William Xavier, '01, 569.
 Nisbet, John Ferguson, '99, 593.
 Nitrogen Thermometer, '99, 593.
 Niuchwang, '00, 668.
 Nobel Prizes, '01, 569.
 Nobles of the Mystic Shrine, '98, 569; '99, 593; '00, 668.
 Noise Nuisance, '00, 668.
 Non-inflammable Wood, '99, 593.
 Nordenskjöld, Baron Adolf Erik, '01, 569.
 Nordhoff, Charles, '01, 570.
 Nordica, Lillian, '98, 569.
 Normal Schools, '01, 570.
 Norris, Frank, '00, 668.
 North America, Botany of, '98, 569.
 North America, Flora of, '98, 569.
 North Carolina, '98, 569; '99, 593; '00, 668; '01, 571.
 North Carolina, University of, '00, 671; '01, 573.
 North Dakota, '98, 573; '99, 595; '00, 671; '01, 573.
 Northrop, Rev. Birdsey Grant, '98, 573.
 Northumberland, Duke of, '99, 596.
 Algernon George Percy, '99, 596.
 Northway, Stephen A., '98, 573.
 Northwest Territories, '98, 574; '99, 596; '00, 672; '01, 574.
 Northwestern University, '00, 673; '01, 575.
 Norway, '98, 574; '99, 598; '00, 673; '01, 575.
 Notre Dame, University of, '00, 674.
 Nova Scotia, '98, 576; '99, 598; '00, 675; '01, 576.
 Noyes, Henry Drury, '00, 676.
 Nubar Pasha, '99, 599.
 Nugent, John, '99, 600.
 Numismatic and Archaeological Society, American, '98, 577.
 Nurses, Trained, '98, 577; '99, 600; '01, 577.
 Oats, '98, 578; '99, 601; '00, 676; '01, 577.
 Oberammergau, Passion Play at, '00, 704.
 Oberlin College, '00, 676; '01, 578.
 Obesity, '01, 578.
 Obock, '00, 677; '01, 578.
 Observatories, Astronomical, '00, 677.
 Ocean Records, '98, 579.
 Oceans, '98, 579.
 Oohres, '98, 579; '99, 601; '00, 677; '01, 578.
 Odd Fellows, '98, 579; '99, 601; '00, 677; '01, 578.
 Oglesby, Richard James, '99, 602.
 O'Hara, William, '99, 602.
 Ogilvie, Clinton, '00, 677.
 Ohio, '98, 579; '99, 602; '00, 677; '01, 579.
 Ohio State Archaeological and Historical Society, '99, 604.
 Oil Painters, Society of, '99, 604; '00, 661.
 Okapi, '01, 580.
 Oklahoma, '98, 582; '99, 604; '00, 681; '01, 580.
 Okuma, Count, '98, 583.
 Old-Age Pension Movement, '99, 606; '01, 583.
 Old Catholics, '98, 583.
 Oleomargarine, '01, 582.
 Omaha Exhibition, or Trans-Mississippi and International Exhibition, '98, 583.
 Oman, '01, 583.
 Ontario, '98, 584; '99, 609; '00, 683; '01, 583.
 Opera, '98, 585; '99, 559; '00, 629.
 Ophthalmological Society, American, '98, 585.
 Orange Free State, '98, 585; '99, 610.
 Orange River Colony, '00, 684; '01, 584.
 Oratorio Society, '99, 611.
 Oratorio Society of New York, '98, 585.
 Order of the Eastern Star, '98, 585.
 Order of Founders and Patriots of America, '98, 585.
 Ore Deposits, '99, 611; '00, 685; '01, 585.
 Oregon, '98, 586; '99, 612; '00, 685; '01, 586.
 Organic Chemistry, '00, 687.
 Oriental Society, American, '98, 587; '99, 613; '00, 687.
 Orleans, Henri Philippe Marie, Prince d', '01, 587.
 Orleans, Duc d', Prince Louis Philippe Robert, '98, 587.
 Ormerod, Miss Eleanor A., '01, 587.
 Ormiston, William, '99, 613.
 Ornithologists' Union, American, '98, 587.
 Ornithology, '98, 587; '99, 613; '00, 687; '01, 587.
 Orthopaedic Association, American, '98, 588.
 Orton, Arthur, '98, 588.
 Orton, Edward, '99, 614.
 Orzeszko, Eliza, '01, 589.
 Osborn, Henry Fairfield, '00, 689.
 Osborne, Thomas A., '98, 589.
 Osiris, Tomb of, '98, 589.
 Osman Digna, '00, 690.
 Osman Nuri Pasha Ghazi, '00, 690.
 Osteopathy, '98, 589; '01, 589.
 Ostro-Toxismus, '99, 615.
 Otis, Elwell Stephen, '98, 589; '99, 615; '00, 690.
 Otis, Fessenden Nott, '00, 690.
 Otis, Harrison Gray, '99, 615.
 Ottawa Fire, '00, 691.
 Otological Society, American, '98, 590.
 Ottendorfer, Oswald, '00, 691.
 Oxycamphor, '99, 615.
 Oxygen, Magnetic Susceptibility of Liquid, '98, 590.
 Oyster Culture, '00, 691.
 Oyster Fisheries, '98, 590; '99, 616; '00, 691.
 Ozokerite, '00, 691.
 Ozone, '98, 590; '99, 616.
 Pacific Cable, '01, 590.
 Packard, Silas Sadler, '98, 590.
 Paderewski, Ignace Jan, '99, 616.
 Pædiatric Society, American, '98, 590; '99, 616; '00, 691.
 Paget, James, '99, 616.
 Pailleron, Edouard Jules Henri, '99, 616.
 Painting, '98, 590; '99, 616; '00, 691; '01, 590.
 Painting, Exhibition of (England), '98, 595.
 Painting and Sculpture, Progress of, During the 19th Century, '00, 987.
 Palacio, Raimundo Andrieza, '00, 695.
 Paleontology, '99, 622; '00, 696; '01, 595.
 Palestine, '00, 696; '01, 595.
 Pallavicini, Emilio, '01, 595.
 Palma, Tomas Estrada, '01, 595.
 Palmer, Arthur, '98, 595.
 Palmer, John McAuley, '00, 696.
 Pana, Ill., '98, 595.
 Panama Canal, '98, 596; '00, 697; '01, 595.
 Panama, Isthmus of, '98, 595.
 Pan - American Conference, '00, 697; '01, 595.
 Pan - American Exposition, '99, 622; '00, 697; '01, 595.
 Pancreatic Digestion and Gases, '98, 595.
 Pancreon, '01, 598.
 Panizzardi, Lieutenant Colonel, '98, 595.
 Papyrus, '98, 595.
 Paraguay, '98, 595; '99, 622; '00, 697; '01, 599.
 Parasitic Hemoptysis, '00, 698.
 Paris Exposition, '98, 597; '99, 624; '00, 699.
 Park, Edwards Amasa, '00, 702.
 Parke, John Grubb, '00, 702.
 Parker, Edwin W., '01, 599.
 Parker, Horatio Gilbert, '01, 599.
 Parker, Horatio William, '99, 626.
 Parks, Parkways, and Playgrounds, '98, 597; '99, 626; '00, 703.
 Parnell, Mrs. Della Tudor Stewart, '98, 597.
 Paros, '98, 597.
 Parthenogenesis, Artificial, '00, 704; '01, 599.
 Parthenogenesis in Plants, '98, 597.
 Partridge, Frederick W., '99, 627.
 Passion Play at Oberammergau, '00, 704.
 Passy, Frederick, '01, 599.
 Patent Statistics, '98, 597; '99, 627.
 Paterson, William, '99, 627.
 Paton, Sir Joseph Noel, '01, 600.
 Patten, E. Jarvis, '00, 705.
 Paty de Clam, Mercier du, '98, 596.

- Pauncefote, Baron, Julian
 Pauncefote, '99, 628; '01, 600.
 Pauperism, '00, 705; '01, 600.
 Pavements and Roads, '98, 598; '99, 628; '00, 708; '01, 600.
 Payn, James, '98, 599.
 Payne, Charles Henry, '99, 629.
 Payne, Henry C., '01, 602.
 Payne, Sereno E., '99, 630.
 Peabody Museum, '98, 599; '99, 630; '00, 708.
 Pearl Buttons, '00, 708.
 Pearson, John Loughborough, '98, 599.
 Pearsons, Daniel Kimball, '01, 602.
 Peary, Robert Edwin, '98, 599.
 Pease, Arthur, '98, 600.
 Peck, Ferdinand W., '98, 600.
 Peck, James Ingraham, '98, 600.
 Peck, Sir Cuthbert Edgar, '01, 602.
 Peet, Isaac Lewis, '98, 600.
 Peking, '00, 708.
 Pelews, '99, 630.
 Pelleux, General de, '98, 600.
 Pemberton, Max, '98, 600; '99, 630.
 Pennsylvania, '98, 600; '99, 630; '00, 708.
 Pennsylvania, Academy of Fine Arts, '98, 603.
 Pennsylvania, University of, '98, 603; '99, 633; '00, 715; '01, 607.
 Pensions, '98, 603; '99, 633; '00, 716; '01, 608.
 Pensions for Workingmen, '01, 609.
 Pensions, Old-age, '98, 606.
 Pencyulk Experiments, '99, 635.
 Penzance, Baron, James
 Plaisted Wilde, '99, 635.
 People's Choral Union, '98, 606; '99, 635; '00, 717.
 People's Singing Classes, '98, 606.
 Pepper, William, '98, 606.
 Perez, Santiago, '00, 717.
 Pernicious Fever, '98, 606.
 Perosi, Lorenzo, '98, 606; '99, 635.
 Perry, William Flake, '01, 611.
 Perry, William Stevens, '98, 606.
 Perseus, New Star in, '01, 611.
 Persia, '98, 607; '99, 636; '00, 717; '01, 611.
 Personality, '01, 613.
 Peru, '98, 608; '99, 636; '00, 719; '01, 613.
 Pesnelle, Eugène, '99, 639.
 Peters, J. B., '99, 639.
 Petrography, '98, 607; '99, 639; '01, 615.
 Petroleum, '98, 607; '99, 640; '00, 721; '01, 614.
 Petroleum Drinking, '00, 721; '01, 615.
 Pettenkofer, Max von, '01, 615.
 Phelps, Edward John, '00, 721.
 Phelps, Thomas Stowell, '01, 615.
 Phi Beta Kappa, '98, 610; '99, 640; '00, 722.
 Philadelphia Exposition, '99, 640.
 Philharmonic Society, '98, 610; '99, 640; '00, 722.
 Philharmonic Society of New York, '98, 611.
 Philip, John Woodward, '00, 722.
 Philippines, '98, 611; '99, 640; '00, 722; '01, 616.
 Phillips, Stephen, '00, 727.
 Philpotts, Eden, '00, 728.
 Philological Association, American, '98, 614; '99, 644; '00, 728.
 Philology, '98, 614; '99, 644.
 Philosophical Society, American, '98, 619.
 Philosophy, Progress of, during the 19th Century, '00, 988.
 Phosphates, '98, 619; '99, 648; '00, 728; '01, 624.
 Phosphorus, '98, 619.
 Photographic Astronomy, '98, 619.
 Photographing Sound Waves, '00, 728.
 Photography, '99, 648.
 Photography, Stellar, '01, 624.
 Photography, Medical, '01, 624.
 Photography with Visual Telescopes, '00, 728.
 Phototherapy, '99, 649; '00, 728; '01, 624.
 Phrygian Rock Tombs, '98, 619.
 Physical Chemistry, '00, 728.
 Physical Geology, '99, 650.
 Physical Society, American, '99, 651; '00, 728.
 Physical Training, '99, 651.
 Physicians, Association of, American, '99, 651; '00, 729.
 Physics, '98, 619; '99, 651; '00, 729; '01, 624.
 Physics, Progress of, during the 19th Century, '00, 976.
 Physiological Society, American, '98, 632; '99, 664; '00, 733.
 Physiology, Chemical, '01, 629.
 Phytogeography, '98, 632.
 Platti, Carlo Alfredo, '01, 630.
 Picard, Lemerclier, '98, 632.
 Picking, Henry F., '99, 664.
 Picquart, Georges, '98, 633; '99, 664.
 Pierce, Gilbert Ashville, '01, 631.
 Pierce, Henry Niles, '99, 664.
 Pierpont, Francis H., '99, 664.
 Pig Iron, '98, 633.
 Pilgrim Fathers, United Order of, '98, 633.
 Pillager Outbreak, '98, 633.
 Pillsbury, Charles Alfred, '99, 664.
 Pillsbury, John Sargent, '01, 631.
 Pillsbury, Parker, '98, 634.
 Piner, Arthur Wing, '98, 634.
 Pingree, Hazen S., '99, 665; '01, 631.
 Pipe, '98, 634.
 Pipe Lines, '98, 634; '99, 665; '00, 733.
 Piper, Mrs. Leonora, '01, 631.
 Pirene, '98, 635.
 Pitt-Rivers (Fox-Pitt-Rivers), Augustus H. L., '00, 734.
 Pi y Margall, Francisco, '01, 631.
 Plague, '98, 635; '99, 665; '00, 734; '01, 631.
 Plaisted, Harris M., '98, 635.
 Planetoids, '98, 635; '99, 666; '00, 735; '01, 632.
 Plant, '98, 635.
 Plant Geography, '98, 636.
 Plant, Henry Bradley, '99, 667.
 Plant Pathology, '98, 636.
 Platinum, '98, 636; '99, 667; '00, 735; '01, 632.
 Platt, Franklin, '00, 735.
 Platt, Orville Hitchcock, '01, 632.
 Playfair, Sir Lyon, '98, 636.
 Playfair, Robert Lambert, '99, 667.
 Playgrounds, '98, 636; '99, 667.
 Pleistocene, '98, 636.
 Plimsoil, Samuel, '98, 636.
 Pliocene, '98, 636.
 Plumbing, Gas, '01, 633.
 Plutonic Rocks, '98, 636.
 Pneumatic, or Tubular Dispatch, '98, 636.
 Pneumonia, '98, 638; '99, 667.
 Pöbodonostzeff, Constantine Petrovitch, '01, 633.
 Poland, John S., '98, 638.
 Pole Star, '99, 667.
 Pole, William, '00, 735.
 Political and Social Science, American Academy of, '99, 667; '00, 735; '01, 633.
 Political Economy, '00, 737; '01, 635.
 Political Economy, Progress of, during the 19th Century, '00, 993.
 Polo, '99, 667; '00, 739; '01, 638.
 Polo, Water, '99, 668.
 Polonium, '98, 639.
 Polynesia, Botany of, '98, 639.
 Polynesia, Flora of, '98, 639.
 Pompeian Discoveries, '98, 639.
 Ponapé, '99, 668.
 Pond, George Edward, '99, 668.
 Ponsi, Madame (Elizabeth Ponsi Wallis), '99, 668.
 Pool, '99, 668; '00, 739; '01, 639.
 Pool, Maria Louise, '98, 639.
 Pope, Charles A., '99, 668.
 Port Arthur, '00, 739.
 Porter, Fitz-John, '01, 639.
 Porter, John Addison, '98, 639.
 Porter, Sarah, '00, 739.
 Porto Rico, '98, 667; '99, 668; '00, 739; '01, 639.
 Portrait Gallery, National, '99, 669.
 Portugal, '98, 639; '99, 669; '00, 745; '01, 644.
 Portuguese East Africa, '01, 645.
 Portuguese Guinea, '98, 639; '99, 669; '00, 746; '01, 645.
 Portuguese West Africa, '01, 645.
 Posse, Count Arvid, '01, 646.
 Postal Microscopic Club, American, '98, 640.
 Potassium Cyanide, '01, 646.
 Potatoes, '98, 640; '99, 669; '00, 747; '01, 646.
 Potter, Eliphalet Nott, '01, 647.
 Potter, Thomas Bayley, '98, 640.
 Poulett, Earl of, William Henry Poulett, '99, 670.
 Powell, Maud, '98, 641.
 Prado, Marino Ignacio, '01, 647.
 Precious Stones, '01, 647.
 Prentiss, Benjamin Mayberry, '01, 647.
 Presbyterian Church in England, '98, 641; '99, 670; '00, 747.
 Presbyterian Church of the United States (North), '98, 641; '99, 670; '00, 747; '01, 647.

- Presbyterian Church of the United States (South), '98, 641; '99, 671; '00, 748; '01, 648.
 Presbyterians, Reformed, '01, 649.
 Presidential Campaign, '00, 748.
 Press Clubs, International League of, '99, 671; '00, 770.
 Pretorius, Marthinas Wes-sels, '01, 649.
 Prevention of Cruelty to Animals, American Society for the, '99, 671; '00, 770; '01, 649.
 Prevention of Cruelty to Animals, Massachusetts Society for the, '99, 671; '00, 770.
 Prevention of Cruelty to Children, New York Society for the, '99, 671; '00, 770; '01, 649.
 Price, Bartholomew, '98, 641.
 Price, Rose Lambert, '99, 671.
 Priestley, William Overend, '00, 770.
 Prime, Frederick Edward, '00, 771.
 Primitive Methodists, '98, 641; '99, 671; '00, 771; '01, 649.
 Prince Edward Island, '98, 642; '99, 671; '00, 771; '01, 650.
 Princeton University, '98, 642; '99, 672; '00, 771; '01, 650.
 Prism Spectrum, '98, 642.
 Prison Association, National, '00, 772.
 Prison Association of New York, '99, 672.
 Private Banks, '01, 650.
 Private Law During 19th Century, '00, 995.
 Prodigy, an Arithmetical, '99, 672.
 Professional Schools, '01, 651.
 Protective Association, American, '98, 642.
 Protective Tariff League, American, '98, 642; '99, 673; '00, 772.
 Protestant Episcopal Church, '98, 643; '99, 673; '00, 772; '01, 652.
 Protoplasm, Vegetal, '98, 643.
 Prussia, '98, 643; '99, 673; '01, 658.
 Pryor, Luke, '00, 773.
 Pseudo-Influenza, '99, 673.
 Psychical Research, '98, 644; '99, 673.
 Psychical Research, The Society for, '99, 674; '00, 773; '01, 653.
 Psychological Association, American, '98, 645; '99, 674; '00, 773.
 Psychology, '98, 645; '99, 674; '00, 773.
 Psychology, Experimental, '98, 646; '99, 676; '00, 775; '01, 657.
 Psychology of Reading, '98, 666; '99, 681; '01, 667.
 Psychology, Progress of, during the 19th Century, '00, 978.
 Psycho-Therapeutics, '99, 682.
 Pteridophyta, '98, 655.
 Public Health, '99, 682; '00, 780; '01, 663.
 Public Health and Vital Statistics, '98, 655.
 Public Health Association, American, '98, 655; '99, 682; '00, 780.
 Public Schools, '01, 663.
 Puccini, Giacomo, '00, 780.
 Puerto Rico, '98, 657; '99, 683; '00, 739; '01, 639.
 Pugh, Edwin William, '98, 658.
 Pullman, '98, 658.
 Pumice, '98, 659.
 Pumping Engines, '98, 659.
 Pupin, Michael Idvorsky, '00, 781.
 Putnam, Herbert, '99, 684.
 Putnam, Mary Lowell, '98, 659.
 Puvis de Chavannes, Pierre Cecile, '98, 659.
 Pyrite, '99, 684; '00, 781; '01, 663.
 Pythias, Knights of, '01, 663.
 Quain, Sir Richard, '98, 680.
 Quakers, '98, 680; '00, 781; '01, 663.
 Quaritch, Bernard, '99, 684.
 Quarles, Joseph Very, '99, 684.
 Quartz, '01, 663.
 Quay, Matthew Stanley, '99, 685; '00, 781.
 Quebec, '98, 680; '99, 685; '00, 781; '01, 663.
 Queensberry, Marquis of, '00, 782.
 Queensland, '98, 681; '99, 686; '00, 782; '01, 664.
 Quénay de Beaurepaire, Jules, '99, 687.
 Quicksilver, '99, 687; '00, 783; '01, 665.
 Quincy, Josiah, '99, 687.
 Quintard, Charles T., '98, 682.
 Rabies, '99, 687; '00, 783; '01, 665.
 Rachmaninoff, Sergei Vassilevitch, '99, 687.
 Racquets and Court Tennis, '99, 688; '00, 784; '01, 665.
 Radium, '98, 682.
 Rail Joints, '98, 682.
 Railway Association, American, '98, 682; '99, 688.
 Railways, '98, 682; '99, 688; '00, 784; '01, 665.
 Railway Cars, '98, 683.
 Railway Stations, '98, 683.
 Railway Surgeons, American Academy of, '99, 693.
 Rains, George Washington, '98, 683.
 Randolph-Macon System of Colleges and Academies, '99, 693.
 Ranney, Ambrose Arnold, '99, 693.
 Raoult, Francis Marie, '01, 667.
 Rapid Transit, '98, 683; '99, 693; '00, 786.
 Rawlinson, Robert, '98, 686.
 Reading, Psychology of, '98, 686; '99, 695; '01, 667.
 Rearick, Peter Anton, '01, 667.
 Rechabites, Independent Order of, '98, 686.
 Recreation Piers, '98, 686; '00, 789.
 Red Cross Society, The American National, '98, 686; '99, 695; '00, 789.
 Redhead, Richard, '01, 667.
 Red Men, Improved Order of, '98, 686.
 Redmond, John Edward, '01, 667.
 Reed, Roland Lewis, '01, 688.
 Reed, Thomas Brackett, '99, 695.
 Rees, Josiah, '99, 696.
 Reform Christian Science Church Association, '00, 789; '01, 688.
 Reformed Church in America, Dutch, '98, 686; '99, 696; '00, 789; '01, 688.
 Reformed Church in the United States, German, '98, 686; '99, 696; '00, 789; '01, 688.
 Reformed Episcopal Church, '98, 687; '99, 696; '00, 790; '01, 689.
 Reformed Presbyterians, '98, 687; '99, 696; '00, 790; '01, 689.
 Refrigeration, '98, 687.
 Refuse Disposal, '98, 687.
 Regeneration, '99, 696; '00, 790; '01, 689.
 Relapsing Fever, '99, 696.
 Religion, Progress of, During the 19th Century, '00, 990.
 Religions of the World, '98, 687.
 Remenyi, Edouard, '98, 687.
 Remy, George Collier, '00, 790.
 Remsen, Ira, '01, 689.
 Republican League of the United States, National, '99, 696; '00, 790.
 Reservoirs, '98, 687; '00, 790.
 Resistance of Electrolytes, Measurement of, '98, 687.
 Resistance, Standard High, '98, 688.
 Reszke, Edouard de, '98, 688.
 Reszke, Jean de, '98, 688.
 Réunion, '98, 688; '99, 696; '00, 790; '01, 689.
 Reuter, Paul Julius von, '99, 696.
 Reynolds, Joseph Jones, '99, 697.
 Rhode Island, '98, 688; '99, 697; '00, 790; '01, 689.
 Rhodes, Cecil, '99, 699.
 Rhodesia, '98, 670; '00, 699; '00, 792; '01, 671.
 Rhythm, Psychology of, '01, 672.
 Rice, '01, 672.
 Rice Culture, '99, 700.
 Richardson, Abbey Sage, '00, 793.
 Richardson, John Peter, '99, 700.
 Richebourg, Jules Emile, '98, 671.
 Richter, Hans, '98, 671.
 Ridpath, John Clark, '00, 793.
 Riesco, Jerman, '01, 672.
 Riggs, Elias, '01, 672.
 Rils, Jacob Augustus, '01, 672.
 Rimski - Korsakoff, Nicolai Andreyevich, '98, 671.
 Ristic, Jowan, '99, 700.
 Ritchie, Anne Isabella Thackeray, '98, 671.
 Ritualism, '98, 671.
 River, Alphonse Pierre Octave, '98, 671.
 Roads, '99, 701; '01, 673.
 Roberts, Brigham Henry, '99, 701; '00, 794.
 Roberts, Earl, Frederick Sleigh Roberts, '99, 701; '00, 794; '01, 338.
 Roberts, Joseph, '98, 671.
 Roberts, William, '99, 702.
 Robertson, William H., '98, 671.
 Robinson, Charles Seymour, '99, 702.
 Rock, Miles, '01, 673.
 Rockhill, William Woodville, '00, 794.
 Rod, Edouard, '98, 672.

- Rodin, Auguste, '98, 672.
 Roe, Francis Asbury, '01, 673.
 Rogers, John Rankin, '01, 673.
 Rogers, William Augustus, '98, 673.
 Rollins, Mrs. Alice Wellington, '98, 673.
 Roman Catholic Church, '98, 673; '99, 703; '00, 794; '01, 673.
 Roman Forum, '98, 674.
 Romero, Don Matias, '98, 674.
 Romulus, Tomb of, '98, 674.
 Röntgen Rays in Medicine, '98, 672; '99, 703; '01, 675.
 Röntgen Rays in Surgery, '00, 795.
 Röntgen, Wilhelm Conrad, '01, 675.
 Roosevelt, Theodore, '98, 674; '99, 703; '01, 675.
 Root, Elihu, '99, 703.
 Roper, Jesse Mims, '01, 677.
 Ropes, John Codman, '99, 704.
 Rose, Society of the, '99, 704; '00, 796.
 Rosebery, Fifth Earl of, '01, 677.
 Rosecrans, William Stark, '98, 675.
 Ross, Jonathan, '99, 704.
 Ross, Lawrence Sullivan, '98, 676.
 Rostrand, Edmond, '98, 676; '00, 796.
 Rothschild, Baron Ferdinand James de, '98, 677.
 Rothschild, Baron Wilhelm Carl von, '01, 677.
 Rothwell, Richard Pennefather, '01, 677.
 Rough Riders' Association, '98, 677; '99, 705.
 Roumania, '99, 705; '00, 796; '01, 677.
 Rowing, '99, 706; '00, 797; '01, 679.
 Rowland, Henry Augustus, '01, 679.
 Royal Academy Exhibition, '98, 677.
 Royal Academy, London, '98, 677; '99, 707; '00, 797; '01, 680.
 Royal Academy of Sciences, Berlin, '99, 707.
 Royal Academy of Vienna, '98, 677.
 Royal Arch Masons, '98, 677; '99, 707; '00, 798.
 Royal Asiatic Society, '98, 677; '99, 707.
 Royal Astronomical Society, '99, 707.
 Royal College of Art, '98, 678.
 Royal Institute of Painters in Water-colors, '98, 678.
 Royal Order of Scotland, '98, 678.
 Royal Scottish Academy, '98, 678.
 Royal Society, London, '98, 678; '99, 707; '00, 798; '01, 680.
 Royal Society of Painter Etchers, '98, 678.
 Royal Society of Painters in Water-colors (London), '98, 678.
 Royal Templars of Temperance, '98, 678.
 Rumsey, Almaric, '99, 707.
 Runaway Stars, '98, 678.
 Rubber, '00, 798; '01, 681.
 Rubies, '01, 681.
 Ruby Mines, '00, 798.
 Ruggles, James M., '01, 681.
 Ruskin, John, '00, 798.
 Ruskin Society of London, '98, 678; '99, 708; '00, 800.
 Russpoll, Prince di, '99, 708.
 Russell, Charles Arthur, '00, 800.
 Russell, William Augustus, '99, 708.
 Russell, William Clark, '98, 678.
 Russia, '98, 678; '99, 708; '00, 800; '01, 681.
 Russia, Progress of, during the 19th Century, '00, 1015.
 Russian Church, '98, 685.
 Russian Literature, '98, 685; '99, 712; '00, 806; '01, 684.
 Rutgers College, '00, 807.
 Rutherford, William, '99, 714.
 Rye, '98, 686; '99, 714; '00, 807.
 Ryland, Robert, '99, 714.
 Safford, Truman Henry, '01, 686.
 St. Andrew, Brotherhood of, '99, 714; '00, 808; '01, 686.
 St. Christopher, or St. Kitts, '99, 714; '00, 808; '01, 686.
 St. Louis Exposition, '01, 686.
 St. Lucia, '99, 715; '00, 808; '01, 686.
 St. Pierre and Miquelon, '98, 686; '99, 715.
 Saint-Saens, '98, 687.
 St. Vincent, '99, 715; '00, 808; '01, 686.
 St. Vincent de Paul, Sisters of Charity of, '99, 715.
 St. Vincent de Paul, Society of, '99, 715.
 Salaman, Charles Kensington, '01, 686.
 Salisbury, Edward Elbridge, '01, 686.
 Salisbury, Lady Georgina, '99, 715.
 Saléza, Albert, '98, 687.
 Salon, '98, 687.
 Salt, '98, 687; '99, 715; '00, 808; '01, 687.
 Salts on Blood Corpuscles, '98, 687.
 Salvador, '98, 687; '99, 796; '00, 808; '01, 687.
 Salvation Army, '98, 688; '99, 716; '00, 809; '01, 687.
 Salvin, Osbert, '98, 688.
 Samford, William J., '01, 688.
 Samoan Islands, '98, 688; '99, 717; '00, 809; '01, 688.
 Sampson, William T., '98, 689.
 Sandstone, '98, 690.
 Sandwich Islands, '98, 690.
 Sanford, George Edward Langham Somerset, '01, 688.
 Sanford, W. E., '99, 720.
 San Francisco, '98, 691.
 Sanger, William Cary, '01, 688.
 Sanitary Aspects of Gas Lighting, '01, 689.
 Sanitary Association, American, '98, 690.
 Sanitary Legislation, '98, 691; '01, 689.
 Sanitation, '98, 691; '99, 721; '00, 810.
 Santo Domingo, '98, 690; '99, 719; '00, 810; '01, 689.
 Santos-Dumont, Alberto, '01, 689.
 Sapphires, '00, 811; '01, 689.
 Sarawak, '98, 691; '99, 124; '00, 132; '01, 689.
 Sarcey, Francisque, '99, 721.
 Sartori, Louis C., '99, 721.
 Sarcoma, '98, 691.
 Sargent, John Singer, '98, 691.
 Saturn, a New Satellite of, '99, 721.
 Saunders, Alvin, '99, 721.
 Savage, Thomas, '99, 722.
 Savings Banks, '01, 689.
 Sawyer, Thomas Jefferson, '99, 722.
 Saxe-Coburg, Duke of, '00, 811.
 Saxe-Weimar-Eisenach, Grand Duke of, Charles Alexander, '01, 691.
 Scanlan, William J., '98, 691.
 Scarlet Fever, '98, 691; '99, 722.
 Scartazzini, Johannes Andreas, '01, 691.
 Schalk, Franz, '98, 691.
 Scheurer-Kestner, Auguste, '99, 723.
 Scheurer-Kestner, M., '98, 691.
 Schley Court of Inquiry, '01, 691.
 Schley, Winfield Scott, '98, 691.
 Schmidt, Johannes, '01, 693.
 Schönborn, Franz, '99, 723.
 Schools, '99, 723; '00, 811; '01, 694.
 School at Athens, American, '98, 692.
 Schott, Charles Anthony, '01, 694.
 Schreiner, W. P., '99, 723.
 Schriver, Edmund, '99, 724.
 Schroeder, Frederick A., '99, 724.
 Schumann-Heink, Ernestine, '98, 692.
 Schur, Wilhelm, '01, 694.
 Schurman, Jacob Gould, '99, 724.
 Schwab, Charles M., '01, 696.
 Schwarzhoff, Julius Karl von Gross von, '01, 696.
 Schwarzkoppen, Colonel von, '98, 692.
 Schweinitz, General Hans Lothar von, '01, 696.
 Sciatica, '99, 724.
 Science, Christian, '98, 196; '99, 724; '00, 811; '01, 182.
 Sciences, Imperial Academy of, '99, 724.
 Sciences, National Academy of, '99, 725; '00, 811; '01, 696.
 Scientific Expedition, '99, 725; '00, 811; '01, 696.
 Scotch-Irish Society, '98, 692; '99, 725.
 Scotland, '98, 692; '99, 725; '00, 811; '01, 696.
 Scotland, Church of, '98, 692; '99, 725; '00, 811; '01, 696.
 Scotland, Church of (the Episcopal Church), '98, 692.
 Scotland, Free Church of, '99, 725; '00, 811; '01, 696.
 Scott, Nathan Bay, '99, 725.
 Scottish Clans, '98, 692.
 Sculpture, '98, 692; '99, 725; '00, 811; '01, 697.
 Sculpture Society, National, '99, 727; '00, 812.
 Seal Fisheries, '98, 694; '99, 727.
 Sealing, '98, 694; '99, 727.
 Search-light, '99, 727.
 Secondary Battery, '98, 694.
 Sequin, Edward Constant, '98, 694.
 Segantini, Giovanni, '99, 727.
 Seidl, Anton, '98, 694.

- Selenium, '98, 694.
 Selwyn, John Richardson, '98, 694.
 Sembrich, Marcella, '98, 695.
 Semmes, Thomas Jenkins, '99, 727.
 Senegal, '98, 695; '99, 727; '00, 812; '01, 698.
 Senff Zoological Expedition, '98-695; '99, 727.
 Senter, De Witt Clinton, '98, 695.
 Septicæmia, Puerperal, '98, 695; '99, 728.
 Septic Tank, '98, 695; '99, 728; '00, 812.
 Sero, Matilde, '01, 698.
 Serum Therapy, '98, 695; '99, 728; '00, 812; '01, 699.
 Serbia, '98, 696; '99, 730; '00, 814; '01, 700.
 Service, James, '99, 730.
 Service Men of the Spanish War, '98, 697.
 Sewage Farming, '98, 697.
 Sewage Purification, '98, 697; '99, 730; '00, 815; '01, 701.
 Sewall, Arthur, '00, 816.
 Sewell, William Joyce, '01, 702.
 Sewerage, '98, 698; '99, 732; '00, 817; '01, 702.
 Sewer Gas, '98, 699; '99, 732.
 Sexton, James A., '99, 733.
 Seymour, Edward Hobart, '00, 817.
 Shafter, William Rufus, '98, 699.
 Shakers, '98, 699; '99, 733; '00, 817; '01, 703.
 Shale, '98, 699; '99, 733.
 Shanghai, '00, 817.
 Shapleigh, Waldron, '01, 703.
 Sharp, William, '98, 699.
 Sharpe, Mrs. Frida Stephenson, '98, 700.
 Shaw, Albert Duane, '99, 733; '01, 703.
 Shaw, Bernard, '98, 700.
 Shearman, Thomas Gaskell, '00, 817.
 Sheldon, Charles L., '98, 700.
 Sheldon, Charles M., '99, 733.
 Shelley's Poems, '98, 700.
 Shepard, Edward Morse, '01, 704.
 Sherman, John, '98, 701; '00, 817.
 Ship-building, '99, 734; '00, 819; '01, 704.
 Shiras, George, Jr., '98, 701.
 Shooting, '99, 734; '00, 820; '01, 706.
 Siam, '98, 701; '99, 735; '00, 820; '01, 706.
 Siberia, '98, 701; '99, 736; '00, 821; '01, 707.
 Sicily, Early Civilization of, '98, 702.
 Sidgwick, Henry, '00, 822.
 Siemens, Georg von, '01, 708.
 Sienna, '01, 708.
 Sierra Leone, '98, 702; '99, 736; '00, 822; '01, 708.
 Signalling, '99, 737.
 Si Gnan Fu, '00, 822.
 Sigsbee, Charles Dwight, '98, 703.
 Slicchester, Excavations at, '98, 703.
 Silk Industry, '98, 703; '99, 737; '00, 822; '01, 709.
 Sill, John Mahelm Berry, '01, 710.
 Stillman, Benjamin Douglas, '01, 710.
 Silvela, Don Francisco, '99, 738.
 Silver, '98, 704; '99, 738; '00, 822; '01, 710.
 Silvestre, Paul Armand, '01, 710.
 Simons, George Henry, '99, 738.
 Simpkins, John, '98, 704.
 Simplon Tunnel, '00, 828; '01, 711.
 Simpson, William, '99, 738.
 Simson, Martin von, '99, 739.
 Singerly, William M., '98, 704.
 Siriasis, '98, 704.
 Sisters of Charity of St. Vincent de Paul, '98, 704.
 Sisters of the Poor, Little, '98, 705.
 Skating, '99, 739; '00, 823; '01, 711.
 Skene, Alexander Johnston Chalmers, '00, 823.
 Slate, '98, 705.
 Sleeping Sickness, '98, 706.
 Smallpox, '98, 706; '99, 739; '00, 823; '01, 711.
 Smart, James Henry, '00, 824.
 Smart, John, '99, 741.
 Smell, Sense of, '98, 706.
 Smith, Charles Emory, '98, 706.
 Smith, Sir Frank, '01, 712.
 Smith, George Murray, '01, 712.
 Smith, James Argyle, '01, 712.
 Smith, Joseph P., '98, 706.
 Smith, Richard, '98, 706.
 Smith, William Hugh, '99, 741.
 Smith College, '98, 707; '99, 741; '00, 824; '01, 713.
 Smithsonian Institution, '98, 707; '99, 741; '00, 824.
 Smoke Prevention, '00, 824; '01, 713.
 Snake Bite, '98, 707; '00, 824.
 Snow, Lorenzo, '98, 707; '01, 713.
 Snow Removal, '98, 707.
 Soapstone, '98, 707; '00, 824; '01, 714.
 Social Democracy of America, '98, 707.
 Socialism, '98, 708; '99, 741; '00, 825; '01, 714.
 Socialists' Trade and Labor Alliance, '98, 710; '99, 743.
 Social Science Association, American, '98, 710; '99, 743; '01, 715.
 Social Settlements, '00, 826; '01, 716.
 Société des XX., '98, 710.
 Society for Plant Morphology and Physiology, '98, 710.
 Society for Psychical Research, '98, 710.
 Society for the Preservation of Virginia Antiquities, '98, 710.
 Society for the Prevention of Cruelty to Animals, '98, 711; '99, 671; '00, 770; '01, 649.
 Society for the Prevention of Cruelty to Children, '98, 711; '99, 671; '00, 770; '01, 649.
 Society for the Promotion of Agricultural Science, '00, 827.
 Society Islands, '98, 711; '99, 743; '00, 827; '01, 716.
 Society of American Artists, '98, 711.
 Society of Colonial Wars, '98, 711.
 Society of Mayflower Descendants, '98, 711.
 Society of Mechanical Engineers, American, '98, 711.
 Society of Naval Architects and Marine Engineers, '98, 712.
 Society of Naturalists, '98, 712.
 Society of Oil Painters, '98, 712.
 Society of St. Vincent de Paul, '98, 712.
 Society of the Army of Santiago de Cuba, '98, 712.
 Society of the Cincinnati, '98, 712.
 Society of the Sons of War Veterans, '98, 712.
 Sociology, '98, 712; '00, 827; '01, 716.
 Sociology, Progress of, during the 19th Century, '00, 992.
 Socotra, '99, 743; '00, 829.
 Solar Parallax, '98, 716.
 Solidification of Hydrogen, '99, 744.
 Solov'yoff, Vladimir Sergeyevich, '00, 829.
 Somaliland, '98, 716; '99, 744; '00, 829; '01, 721.
 Sons of the American Revolution, '98, 716; '99, 744; '00, 830.
 Sons of the Revolution, '98, 716; '99, 744; '00, 830.
 Sons of Veterans, United States Army, '98, 717; '99, 744.
 Sons of War Veterans, Society of the, '99, 744.
 Sorois, '98, 717; '99, 744.
 Soson, '00, 830.
 Soudan, '98, 717; '99, 744; '00, 830; '01, 722.
 South America, '98, 717; '00, 830; '01, 722.
 South America, Botany of, '98, 718.
 South Australia, '98, 718; '99, 744; '00, 831; '01, 723.
 South Carolina, '98, 718; '99, 745; '00, 832; '01, 723.
 South Carolina Interstate and West Indian Exposition, '01, 727.
 South Dakota, '98, 720; '99, 747; '00, 834; '01, 727.
 South, University of the, '00, 836; '01, 729.
 Southworth, Mrs. Emma Dorothy Eliza Nevitte, '99, 749.
 Spain, '98, 722; '99, 749; '00, 836; '01, 729.
 Spain, Progress of, during the 19th Century, '00, 1016.
 Spanish-American War, '98, 724.
 Spanish-American War, National Society of the, '99, 751.
 Spanish Literature, '98, 744; '00, 839; '01, 731.
 Species, '98, 745; '99, 751; '00, 840; '01, 732.
 Specific Heats of Gases, Ratio of, '98, 746.
 Specific Heat of Water, '99, 751.
 Spectroscope, '98, 746.
 Spectroscope of Fixed Deviation, '99, 751.
 Spectroscope, The Echelon, '98, 746.
 Speedways, '01, 732.
 Spencer, Jesse, '98, 746.
 Spermatogenesis (in plants), '98, 746.
 Spermatozoid, '98, 746.
 Spirits, '98, 747.

- Spiritualism, '98, 747; '99, 751.
 Spiritualists, '98, 749; '99, 751.
 Sports, '99, 752; '00, 840; '01, 733.
 Sports, International, '99, 752; '00, 840.
 Sprague, Horatio J., '01, 733.
 Staal, Georges, Baron de, '98, 753.
 Stainer, Sir John, '01, 733.
 Standard Time, '01, 733.
 Stand Pipe, '98, 750.
 Stanford, Charles Villiers, '98, 750.
 Stanford University, '00, 840; '01, 733.
 Stansfield, Sir James, '98, 750.
 Star Catalogues, '98, 750; '99, 753.
 Stars, '01, 733.
 Stars, Dark, '99, 753.
 Stark, Benjamin, '98, 750.
 Starvation, '98, 750.
 State Banks, '01, 733.
 Statistical Association, American, '98, 750; '99, 753.
 Steel, '00, 840; '01, 733.
 Steevens, George Warrington, '98, 750; '99, 753; '00, 840.
 Stein, Robert, '01, 733.
 Steinmetz, Charles Proteus, '01, 733.
 Steintal, Heyman, '99, 753.
 Stellar Parallax, '98, 750; '00, 841.
 Stellar Photography, '98, 750.
 Stephan, Joseph A., '01, 733.
 Stephens, James, '01, 734.
 Stereo-Comparator, '01, 735.
 Sterne, Simon, '01, 735.
 Stewart, Donald Martin, '00, 841.
 Stewart, Sir William Houston, '01, 735.
 Steyn, Martinus Theunis, '99, 754.
 Stillé, Alfred, '00, 841.
 Stillé, Charles Janeway, '99, 754.
 Stillman, William James, '01, 735.
 Stolloff, Constantin, '01, 736.
 Stokes, George Thomas, '98, 750.
 Storage Battery, '98, 750; '01, 736.
 Storer, Bellamy, '99, 754.
 Storrs, Richard Salter, '00, 841.
 Story, Mrs. Julian (Emma Eames), '98, 750.
 Strafford, Earl of, George Henry Charles Byng, '99, 751.
 Strafford, Earl of, Henry William John Byng, '98, 754.
 Straits Settlements, '98, 751; '99, 754; '00, 842; '01, 736.
 Stranahan, James S. T., '98, 751.
 Straus, Oscar S., '98, 751.
 Strauss, Johann, '99, 755.
 Strauss, Richard, '98, 752.
 Street Cleaning, '98, 752; '99, 755; '00, 842.
 Street Pavements, '98, 752.
 Street Railway Association, American, '98, 752.
 Street Railways, '98, 752; '99, 755.
 Streets, '00, 842.
 Street Sprinklers, '01, 737.
 Streptococcus Infection, '98, 752.
 Stricker, Solomon, '98, 752.
 Strikes, '01, 737.
 Strikes and Lockouts, '98, 752; '99, 755; '00, 842.
 Strong, William L., '00, 845.
 Struthers, John, '99, 757.
 Stubbs, Rt. Rev. William, '01, 742.
 Stumm, Baron Karl Ferdinand von, '01, 743.
 Sublimine, '01, 743.
 Submarine Telegraph, '98, 757.
 Suchow, '00, 845.
 Sudermann, Hermann, '99, 757; '00, 845.
 Sudsburg, Joseph M., '01, 743.
 Suez Canal, '98, 758; '99, 757; '00, 845; '01, 743.
 Sugar as a Food, '98, 758.
 Sugar Industry, '98, 758; '00, 845; '01, 743.
 Suggestion, '99, 757.
 Suicide, '98, 760; '99, 758; '01, 747.
 Sullivan, Arthur Seymour, '00, 848.
 Sully - Prudhomme, René François Armand, '01, 747.
 Sulphur, '98, 761; '99, 758; '00, 848; '01, 748.
 Sulu, '99, 759.
 Sumatra, '98, 761; '99, 759; '00, 849; '01, 748.
 Sun, '01, 748.
 Sunday-School Association, '99, 759; '00, 849; '01, 748.
 Sunday-Schools, '98, 762; '99, 759.
 Sunday-School Union, American, '99, 759; '00, 849; '01, 748.
 Sundberg, Anton Niklas, '00, 849.
 Sunderland, Byron, '01, 748.
 Sunstroke, '98, 762.
 Suprenal Extract, '99, 759; '01, 749.
 Surgical Association, American, '98, 762.
 Susa, '98, 762.
 Suspension Bridges, '98, 762; '99, 760.
 Sutro, Adolph Heinrich Joseph, '98, 762.
 Swallow, George Clinton, '99, 760.
 Swanwick, Miss Anna, '99, 760.
 Sweden, '98, 763; '99, 760; '00, 849; '01, 749.
 Swedenborgians, '98, 763; '99, 761; '00, 850; '01, 750.
 Swedenborg Scientific Association, '98, 763.
 Sweeney, John R., '99, 761.
 Swimming, '00, 851; '01, 750.
 Swimming and Water-Polo, '99, 761.
 Swine-Plague, '99, 762.
 Swinton, John, '01, 750.
 Switzerland, '98, 764; '99, 762; '00, 851; '01, 750.
 Symons, William Penn, '99, 762.
 Symphony Orchestra, Boston, '98, 766.
 Synaesthesia, '00, 852.
 Synnot, Joseph, '99, 763.
 Syria, '01, 752.
 Systematic Botany, '98, 766.
 Systematic Zoology, '98, 766; '00, 853.
 Szell, Koloman, '99, 763.
 Sziagi, Desider de, '01, 752.
 Tabor, Horace Austin Warner, '99, 763.
 Taft, William H., '00, 853.
 Tait, Lawson, '99, 763.
 Tait, Peter Guthrie, '01, 752.
 Taku, '00, 853.
 Talbot, Patrick Wellington, '98, 766.
 Talc, '98, 766; '99, 764; '00, 853; '01, 752.
 Tallafarro, James Piper, '99, 763.
 Tallafarro, William Booth, '98, 766.
 Tallenwan, '00, 853.
 Tall Buildings, '98, 766; '99, 764.
 Tammany, Society of, '99, 765; '00, 853.
 Tanner, Charles Kerns Drase, '01, 752.
 Tanner, John Riley, '01, 752.
 Tantalum Radiations, '98, 769.
 Tariff, '00, 853.
 Tariff of the United States, '98, 769.
 Tarkington, Booth, '00, 853.
 Taschenberg, Ernst Ludwig, '98, 770.
 Taschereau, Elzear Alexandre, '98, 770.
 Tasmania, '98, 770; '99, 765; '00, 853; '01, 752.
 Taste, Sense of, '98, 770; '01, 753.
 Tate, Henry, '99, 766.
 Taxation, '00, 854.
 Taxonomy (of Plants), '98, 770.
 Taylor, Charles Fayette, '99, 766.
 Taylor, Isaac, '01, 753.
 Taylor, S. Coleridge, '99, 766.
 Taylor, Thomas H., '01, 753.
 Taylor, William S., '00, 854.
 Tchernaleff, Michael Gregorovitch, '98, 770.
 Teachers College, '01, 753.
 Telephony, '99, 766.
 Telegraphing without Wires, '98, 771; '99, 869; '00, 847; '01, 763.
 Telegraphy and Telephony, '00, 854.
 Telescopes, New, '99, 766.
 Telpherage, '01, 753.
 Temple, Thomas, '99, 766.
 Tenement-house Reform, '99, 766; '01, 754.
 Tennessee, '98, 771; '99, 766; '00, 854; '01, 758.
 Tenney, Asa W., '98, 772.
 Tenniel, Sir John, '01, 757.
 Tennis, '98, 772; '99, 768; '00, 856; '01, 757.
 Tennyson, Frederick, '98, 773.
 Ternina, Milka, '99, 768.
 Terriss, William, '98, 773.
 Tertiary, '98, 773; '00, 856.
 Tetanus, '98, 773; '01, 757.
 Texas, '98, 773; '99, 769; '00, 856; '01, 758.
 Texas, University of, '00, 860; '01, 760.
 Textile Mills, '99, 770.
 Thayer, Ell, '99, 771.
 Thayer, Joseph Henry, '01, 760.
 Thayer, William Makepeace, '98, 775.
 Theatre, Greek, '98, 775.
 Thebes, Egypt, '98, 775.
 Theories of Matter, '98, 775.
 Theosophical Society, '98, 775; '99, 771.
 Thermol, '99, 771.
 Thermon, '98, 775.
 Thibet, '98, 775; '99, 771; '01, 760.
 Thomas, John Rochester, '01, 761.
 Thompson, David P., '01, 761.
 Thompson, Mrs. Elizabeth, '99, 771.

- Thompson, Ernest (Evan) Seton, '00, 860.
 Thompson, Frank, '99, 771.
 Thompson (James) Maurice, '00, 860; '01, 761.
 Thompson, Richard Wigginton, '00, 861.
 Thompson, Thomas L., '98, 776.
 Thorium Gas Mantles, '98, 776.
 Thorium Radiations, '98, 776.
 Thorne, Sarah, '99, 772.
 Tides, Theory of Ocean, '99, 772.
 Tiemann, Daniel Fawcett, '99, 772.
 Tientsin, '98, 775; '00, 861.
 Time, Standard, '01, 761.
 Tin, '98, 776; '00, 861; '01, 761.
 Tissandier, Gaston, '99, 772.
 Tissa, Ludwig, '98, 776.
 Tobacco, '00, 861; '01, 761.
 Tobago, '00, 862; '01, 762.
 Togoland, '98, 776; '99, 772; '00, 862; '01, 762.
 Tojetti, Virgilio, '01, 763.
 Tolstoy, Leo, '99, 773; '00, 862; '01, 763.
 Tombs, Euclithic, '98, 777.
 Tombs of the Kings, Thebes, Egypt, '98, 777.
 Tombs Rock of Phrygia, '98, 777.
 Tome, Jacob, '98, 777.
 Tonga Islands, '00, 863.
 Tonquin, '98, 777; '99, 774; '00, 863; '01, 763.
 Topas, '01, 763.
 Topellius, Zacharie, '98, 777.
 Toronto, University of, '99, 774.
 Torpedo Boats, '98, 777.
 Tower, Charlemagne, '99, 774.
 Towne, Charles Arnette, '00, 863.
 Townsend, Lawrence, '99, 774.
 Townshend, Marquis, John Villiers Stuart Townshend, '99, 774.
 Track and Field Athletics, '99, 774.
 Tract Society, American, '98, 779; '99, 774.
 Trade-unions, '99, 774; '00, 863; '01, 763.
 Trade-unions, Congress of, '98, 779.
 Trafton, Mark, '01, 766.
 Traill, Henry Duff, '00, 865.
 Trance, '98, 779.
 Trans-Andean Railway, '00, 866; '01, 766.
 Trans-Mississippi and International Exhibition, '98, 779.
 Trans-Saharan Railway, '00, 866.
 Trans-Siberian Railway, '00, 866; '01, 766.
 Transvaal, '98, 779; '99, 775; '00, 868; '01, 766.
 Trenholm, William Lee, '01, 773.
 Trescott, William Henry, '98, 763.
 Triassic Formation, '99, 789.
 Triferrin, '01, 773.
 Trinidad, '98, 783; '99, 789; '00, 877; '01, 773.
 Trinity College, '00, 878; '01, 774.
 Triple Alliance, '01, 774.
 Tripoli, '98, 783; '99, 790; '00, 878; '01, 775.
 Tropical Diseases, Study of, '99, 790.
 Tropical Fever, '99, 790.
 Tropical Medicine, '00, 878; '01, 775.
 Troubetskoy, Paul, '01, 775.
 Truro, Baron, Thomas Montague-Morrison Wilde, '99, 790.
 Truss Bridges, '98, 783.
 Trust and Loan Companies, '01, 775.
 Trusts, '98, 783; '99, 790; '00, 878; '01, 776.
 Tuan, Prince, '00, 880.
 Tuberculosis, '98, 785; '99, 791; '00, 880; '01, 779.
 Tulane University, '00, 881; '01, 780.
 Tungsten, '01, 780.
 Tunis, '98, 786; '99, 795; '00, 881; '01, 780.
 Tunnels, '99, 795; '00, 881; '01, 780.
 Turin, Giovanni, '99, 796.
 Turkey, '98, 786; '99, 796; '00, 882; '01, 782.
 Turkistan, Russian, '01, 784.
 Turner, John Wesley, '99, 798.
 Turquoise, '01, 784.
 Tuskegee Normal and Industrial Institute, '99, 798; '00, 883; '01, 784.
 Tyler, Moses Colt, '00, 883.
 Tylor, Joseph John, '01, 785.
 Tyng, Stephen Higginson, '98, 789.
 Typhoid Fever, '98, 789; '99, 798; '00, 884; '01, 785.
 Typographical Union, International, '99, 799; '00, 884.
 Uganda, '98, 789; '99, 799; '00, 884; '01, 785.
 Uhl, Edwin F., '01, 785.
 Umber, '01, 785.
 Underground Railways, '99, 800.
 Underground Trolley, '98, 790.
 Union Label, '01, 785.
 Union Veteran Legion, '98, 790; '99, 800.
 Union Veterans' Union, '98, 790; '99, 800.
 Unitarians, '98, 790; '99, 800; '00, 884; '01, 786.
 United American Mechanics, Junior Order of, '98, 790.
 United American Mechanics, Order of, '98, 790.
 United Brethren in Christ, '98, 791; '99, 800; '00, 885; '01, 787.
 United Confederate Veterans, '98, 791; '99, 801.
 United Daughters of the Confederacy, '98, 791.
 United Evangelical Church, '98, 791; '99, 801; '00, 885; '01, 787.
 United Friends, Order of, '98, 791.
 United Methodist Church, '98, 791.
 United Presbyterian Church of North America, '98, 791; '99, 801; '00, 885; '01, 787.
 United Society of Christian Endeavor, '98, 791; '01, 787.
 United Society of Free Baptist Young People, '98, 792; '01, 787.
 United Sons of Confederate Veterans, '98, 792; '99, 801.
 United States, '98, 792; '99, 801; '00, 885; '01, 787.
 United States Daughters of 1812, '98, 855; '99, 820.
 United States Fish Commission, '98, 855; '00, 905; '01, 819.
 United States Military Academy, '00, 905; '01, 819.
 United States, Progress of, During the 19th Century, '00, 1001.
 United States Steel Corporation, '01, 819.
 United Workmen, Ancient Order of, '98, 855.
 Universal Brotherhood, '98, 855; '99, 820.
 Universalists, '98, 855; '99, 820; '00, 905; '01, 824.
 Universities, American Association of, '00, 905; '01, 824.
 Universities and Colleges, '98, 855; '99, 820; '00, 905; '01, 825.
 Universities, Foreign, '98, 873.
 Upham, John J., '98, 873.
 Ural Mountains, '98, 873.
 Uranium Radiations, '98, 873.
 Ureine, '00, 914.
 Uruguay, '98, 873; '99, 838; '00, 913; '01, 830.
 Utah, '98, 876; '99, 840; '00, 914; '01, 831.
 Vacant Lot Cultivation, '98, 878.
 Vaccination, '98, 879; '99, 841; '00, 917; '01, 832.
 Vail, Albert D., '98, 879.
 Vanderbilt, Cornelius, '99, 841.
 Vanderbilt University, '00, 917; '01, 832.
 Van Dyck, Ernest, '98, 879.
 Van Dyke, Henry, '98, 880; '99, 841.
 Van Horn, James J., '98, 880.
 Van Ingen, Henry, '98, 880.
 Van Rooy, Anton, '98, 880.
 Van Stranbenzee, Bowen, '98, 880.
 Van't Hoff, Jacobus Henricus, '01, 832.
 Van Vleet, General Stewart, '01, 832.
 Van Wyck, Augustus, '98, 880.
 Van Wyck, Robert A., '98, 881.
 Variable Stars, '98, 881.
 Variation, '99, 841; '00, 917; '01, 833.
 Variation of Latitude, '98, 881.
 Vassar College, '98, 881; '99, 841; '00, 917; '01, 833.
 Vaughan, Alfred J., '99, 842.
 Veasey, Wheelock Graves, '98, 881.
 Vegetable Chemistry, '98, 882.
 Vegetable Pathology and Physiology, '00, 917.
 Vegetable Physiology, '98, 882.
 Venezuela, '98, 882; '99, 842; '00, 917; '01, 833.
 Ventilation, '98, 885; '99, 845.
 Venus, '98, 885; '99, 845.
 Verbeck, Guido Fridolin, '98, 885.
 Verdi, Giuseppe Fortunino Francesco, '01, 834.
 Verga, Giovanni, '98, 885.
 Verlaine, Paul, '98, 885.
 Vermont, '98, 885; '99, 845; '00, 919; '01, 835.
 Victor Emmanuel III., '00, 921.
 Victoria, '98, 887; '99, 846; '00, 921; '01, 836.
 Victoria, Queen, '01, 837.
 Vierling, Georg, '01, 841.
 Villa, Roman, '98, 887.

- Villard, Henry, '00, 921.
 Villebois-Mareuil, '00, 922.
 Villiers, Charles Felham, '98, 888.
 Villiers, Frederick, '98, 887.
 Virchow, Rudolf, '01, 842.
 Virden, Ill., '98, 888.
 Virginia, '98, 888; '99, 847; '00, 922; '01, 842.
 Virginia, University of, '00, 925; '01, 844.
 Virgin Islands, '99, 848; '01, 844.
 Vitalism, '98, 890; '99, 849.
 Vital Statistics, '99, 849; '00, 925; '01, 844.
 Vivisection, '00, 928; '01, 845.
 Vivo, Diego de, '98, 890.
 Vogel, Julius, '99, 851.
 Vogl, Heinrich, '00, 927.
 Volcanoes, '99, 851.
 Volunteer Medical Corps, American, '98, 890.
 Volunteers of America, '98, 890; '99, 851; '00, 927; '01, 845.
 Vortex, '98, 890.
 Vries, Hugo de, '01, 846.
 Wachusett Dam, '00, 927.
 Wade, James F., '98, 890.
 Wages, '98, 890; '99, 851; '00, 927.
 Wagner, Jacob, '98, 896.
 Wait, John Turner, '99, 852.
 Waite, David Hanson, '01, 846.
 Walcutt, Charles C., '98, 896.
 Waldersee, Alfred, '00, 932.
 Wakeman, Henry Olfey, '99, 853.
 Waldeck - Rousseau, Pierre Marie, '99, 853.
 Wales, Prince of, '01, 846.
 Walfisch Bay, '98, 896; '99, 853.
 Walker, James Alexander, '01, 846.
 Wallace Collection, '98, 896.
 Wallace, Hill, '99, 853.
 Wallace, Robert, '99, 853.
 Wallace, William Henry, '01, 846.
 Waller, Mrs. Emma, '99, 854.
 Walpole, Spenser Horatio, '98, 896.
 Walton, William, '01, 846.
 Walsh, John, '98, 896.
 Walsh, Patrick, '99, 854.
 Walthall, Edward Cary, '98, 896.
 Wantage, First Baron, '01, 846.
 Warburton, Robert, '99, 854.
 Ward, Hamilton, '98, 897.
 Ward, Mrs. Humphry, '98, 897; '00, 932.
 Waring, George E., Jr., '98, 897.
 Warner, Charles Dudley, '00, 932.
 War of 1812, General Society of the, '99, 854; '00, 932.
 Warr, George Charles Winter, '01, 846.
 Warren, Charles, '99, 854; '00, 932.
 Warships, '98, 897.
 Wash-houses, Municipal, '99, 854.
 Washington, '98, 900; '99, 854; '00, 933; '01, 847.
 Washington Academy of Sciences, '98, 901.
 Washington, Booker T., '00, 934.
 Washington Memorial Institution, '01, 848.
 Washington University, '00, 935; '01, 848.
 Water, Drinking, '99, 856.
 Water-gas, '00, 935.
 Waterman, Lewis Edison, '01, 848.
 Water Power, '98, 901; '99, 856.
 Water Purification, '98, 901; '99, 856; '00, 935; '01, 848.
 Water, Specific Heat of, '99, 857.
 Water Supply, '00, 936.
 Water Supply and Typhoid Fever, '99, 857.
 Water Towers, '98, 903.
 Water-works, '98, 903; '99, 857; '00, 936; '01, 849.
 Water - works Association, American, '98, 906; '99, 859; '00, 937.
 Watson, William (Baron), '99, 859.
 Watterson, John Ambrose, '99, 859.
 Watts, George Frederick, '98, 906.
 Watts-Dunton, Theodore, '98, 906.
 Wauchope, Andrew G., '99, 859.
 Weaver, Jonathan, '01, 850.
 Webb, Henry Walter, '00, 937.
 Webb, William Henry, '99, 859.
 Webster, Richard Everard, '00, 938.
 Wehnelt Interrupter, '99, 860.
 Wehnelt, '00, 938.
 Weill, Alexandre, '99, 860.
 Weingartner, Felix, '98, 906.
 Weimhold, Karl, '01, 850.
 Wellesley, Sir George Greville, '01, 850.
 Wellesley College, '98, 906; '99, 860; '00, 938; '01, 850.
 Wellington, Henry Wellesley, '00, 938.
 Wells, '98, 907.
 Wells College, '00, 939.
 Wells, David Ames, '98, 906.
 Wells, David Dwight, '00, 938.
 Wells, H. G., '98, 907.
 Wells, J. Madison, '99, 860.
 Welsbach Light, '00, 939.
 Welti, Emile, '99, 860.
 Wennerberg, Gunnar, '01, 850.
 Wesleyan Methodist Connection of America, '98, 907; '99, 861; '00, 939; '01, 851.
 Wesleyan University, '98, 907; '99, 861; '00, 939; '01, 851.
 West Africa, '98, 908; '99, 861.
 West Africa, British, '98, 908; '99, 862.
 Westcott, Brooke Foss, '01, 851.
 Westcott, Edward Noyes, '99, 865.
 Western Australia, '98, 910; '99, 862; '00, 939; '01, 851.
 Western Reserve University, '00, 940; '01, 852.
 West Indian Hurricanes, '00, 941.
 West Indies, '98, 909; '99, 862; '00, 941; '01, 852.
 West, Joseph Rodman, '98, 908.
 Westminster, Hugh Lupus Grosvenor, '99, 865.
 West Point, '00, 941; '01, 852.
 West Virginia, '98, 909; '99, 863; '00, 941; '01, 852.
 Weyman, Stanley, '98, 910.
 Wharton, Mrs. Edith, '99, 865; '00, 943.
 Wheat, '98, 911; '99, 865; '00, 944; '01, 854.
 Wheaton, Lloyd, '00, 945.
 Wheeler, Benjamin Ide, '99, 866.
 Wheeler, Joseph, '98, 912; '00, 946.
 Whipple, Henry Benjamin, '01, 855.
 Whist, '99, 866; '01, 855.
 Whist League, American, '98, 912; '99, 867; '00, 946.
 Whistler, Joseph Nelson Garland, '99, 867.
 White, Andrew Dickson, '99, 867.
 White Cross Society, '98, 912.
 White, Edward Douglass, '98, 912.
 White, George Stewart, '99, 867; '00, 946.
 White, Gleeson, '98, 913.
 White, Stephen Mallory, '01, 855.
 Whiteing, Richard, '99, 868.
 Whitman, William Edward Seaver, '01, 855.
 Whooping Cough, '98, 913.
 Wiedemann, Gustav, '99, 868.
 Wigger, Right Rev. Winand Michael, '01, 855.
 Wikoff, Charles A., '98, 913.
 Wilde, Oscar Fingal O'Flahertie, '00, 946.
 Wildman, Rounseville, '01, 855.
 Wilhelmina Helene Pauline Marie, '98, 913.
 Wilkinson, Henry Spenser, '00, 946.
 Willard, Frances Elizabeth, '98, 914.
 Wiles, Sir George Ommaney, '01, 856.
 Willey Expedition, '99, 868.
 Williams, Henry Warren, '99, 868.
 Williams, John, '99, 868.
 Williams, John S., '98, 915.
 Williams, Nelson Grosvenor, '98, 915.
 Williams, Monier, '99, 868.
 Williams, Robert, '01, 856.
 Williams College, '98, 915; '99, 868; '00, 946; '01, 856.
 Willis, Edmund Ayburton, '99, 868.
 Wilmer, Richard Hooker, '00, 946.
 Wilmington, N. C., '98, 916.
 Wilmot, Sir Henry, '01, 856.
 Wilson, Henry P. C., '98, 917.
 Wilson, James, '98, 917.
 Wilson, William Dexter, '00, 947.
 Wilson, William Lyne, '00, 947.
 Winchelsea, Earl of, Murray Edward Gordon Finch-Hatton, '98, 917.
 Windmills, '98, 917; '01, 856.
 Windward Islands, '98, 917; '99, 869; '00, 947; '01, 856.
 Wines, Frederick Howard, '99, 869.
 Winfield, John Henry Ducachet, '98, 917.
 Winter, James Spearman, '98, 917.
 Winthrop, William R., '99, 869.
 Wireless Telegraphy, '99, 869; '00, 947; '01, 857.
 Wisconsin, '98, 918; '99, 870; '00, 948; '01, 858.
 Wisconsin, University of, '98, 919; '99, 872; '00, 950; '01, 861.
 Wise, Isaac Mayer, '00, 950.
 Wolcott, Roger, '00, 951.
 Women's Christian Temperance Union, National, '99, 872; '00, 951; '01, 861.

- Women's Clubs, Federation of, '98, 919.
 Women's College of Baltimore, '00, 951.
 Women's National Democratic League, '98, 919.
 Women's Relief Corps, '98, 919.
 Women's Suffrage Association, National American, '99, 872; '00, 951.
 Wood, '99, 872.
 Wood, Edward P., '99, 872.
 Wood, Leonard, '98, 920; '99, 872.
 Woodbury, E. W., '99, 872.
 Woodgate, Edward Robert Prevost, '00, 951.
 Woodmen of America, Fraternity of Modern, '98, 920.
 Woodmen of the World, '98, 920.
 Woodruff, Wilford, '98, 920.
 Wool and Woollen Manufacture, '98, 921; '99, 872; '00, 951; '01, 861.
 Woolf, Michael Angelo '99, 873.
 Woolley, John Granville, '00, 952.
 Worcester, Dean Conant, '99, 873.
 Wrestling, '99, 873; '00, 135; '01, 863.
 Wright, Horatio Gouverneur, '99, 873.
 Wright Irrigation Districts, '98, 923.
 Wuhu, '00, 952.
 Wu Ting Fang, '00, 952.
 Wyoming, '98, 923; '99, 874; '00, 952; '01, 863.
 Xenon, '98, 924.
 X-Rays, '98, 924; '99, 875; '00, 795; '01, 864.
 Yachting, '98, 924; '99, 875; '00, 954; '01, 865.
 Yale University, '98, 924; '99, 876; '00, 954; '01, 865.
 Yamagata, Aritomo, '00, 955.
 Yaquis, '99, 876; '00, 589.
 Yates, John B., '99, 876.
 Yeast, '98, 925.
 Yeatman, James E., '01, 866.
 Yellow Fever, '98, 925; '99, 877; '00, 955; '01, 866.
 Yonge, Charlotte Mary, '01, 866.
 Youmans, William Jay, '01, 866.
 Young, John Russell, '99, 878.
 Young, Samuel Baldwin Marks, '00, 956.
 Young, Mrs. Zina D., '01, 867.
 Younghusband, Charles Wright, '99, 878.
 Young Men's Christian Association, '98, 925; '99, 878; '00, 956; '01, 867.
 Young People's Christian Union, '98, 926; '99, 878; '00, 956; '01, 867.
 Young Women's Christian Association, '98, 926; '99, 879; '00, 956.
 Yuan-shi-kai, Viceroy, '01, 868.
 Zachos, John C., '98, 926.
 Zanardelli, Giuseppe, '01, 868.
 Zangwill, Israel, '98, 926; '99, 879.
 Zanzibar, '98, 926; '99, 879; '00, 956.
 Zeeman Effect, '99, 880.
 Zeppelin Air-Ship, '00, 957.
 Zinc, '98, 927; '99, 880; '00, 957; '01, 868.
 Zionist Congress, '00, 958; '01, 869.
 Zola, Emile, '98, 927; '99, 880.
 Zoogeography, '98, 927; '99, 880; '00, 958.
 Zoological Literature, '98, 927; '99, 880; '00, 958; '01, 870.
 Zoological Societies, '98, 929; '99, 883; '00, 959; '01, 870.
 Zoological Expeditions and Stations, '01, 869.
 Zoological Stations, '98, 930; '99, 885; '00, 961.
 Zululand, '98, 932; '99, 887; '00, 963.
 Zymotic Diseases, '98, 932.

